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STEEL

OCT 1 1949

The Magazine of Metalworking and Metalproducing

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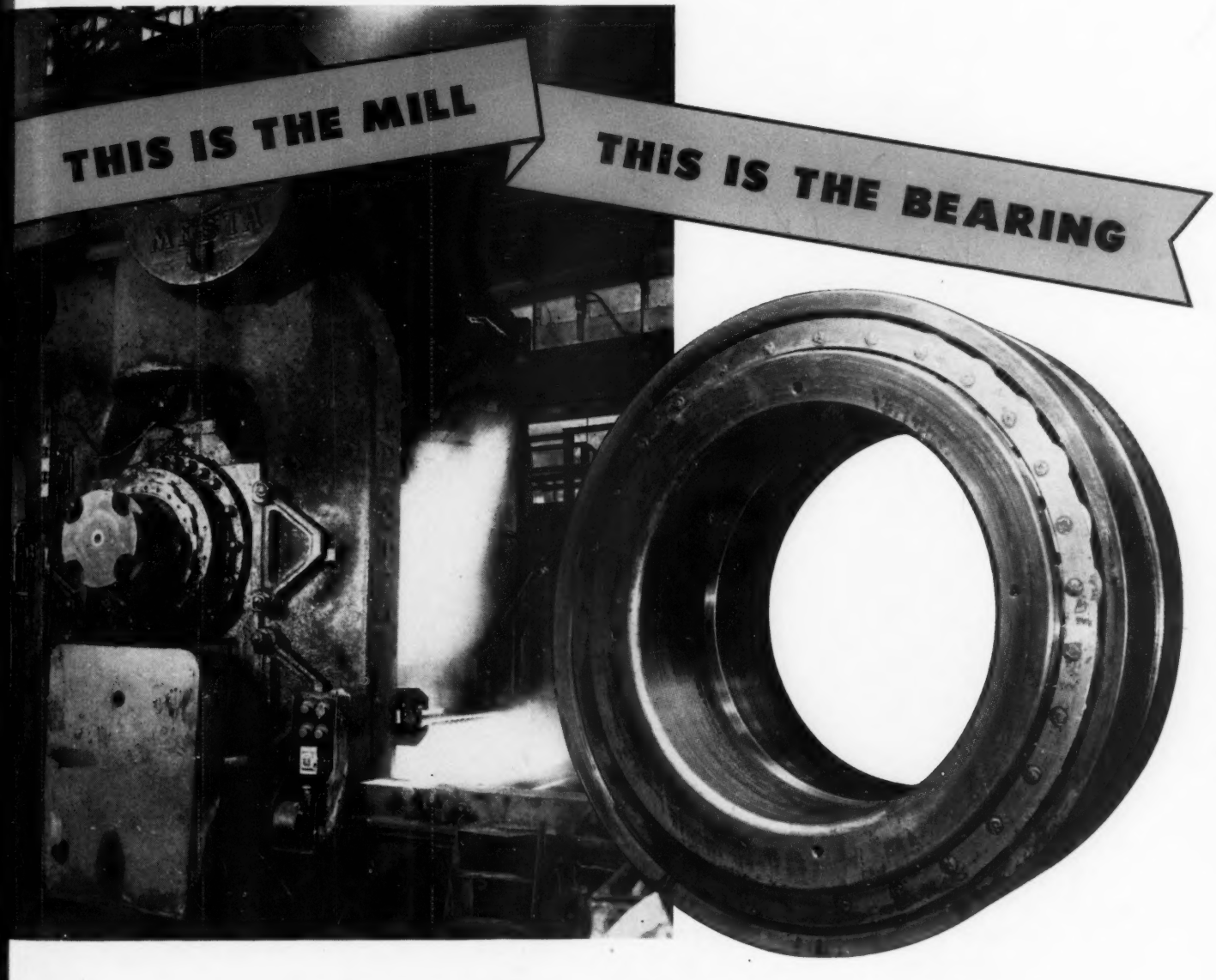

They started out together in 1932 at the Inland Steel Company, Indiana Harbor Works, East Chicago, Indiana. That was more than 17 years ago. They are still together today; still rolling steel with the same speed, efficiency and dependability.

The bearing has a total of 6,154,648 tons to its credit. A recent inspection indicated that it is good for many thousands more.

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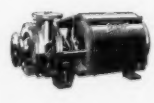

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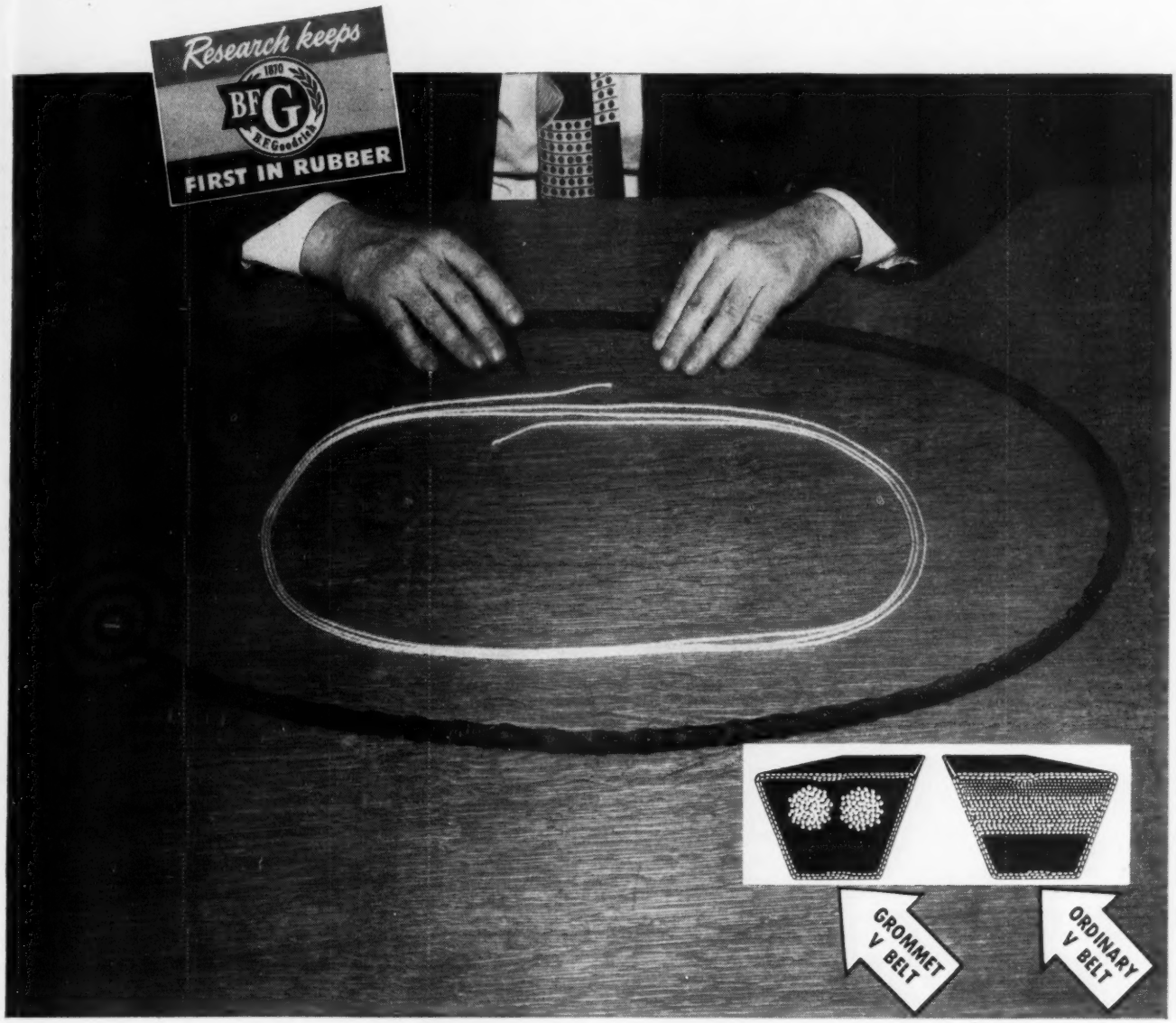

What is this thing called a grommet?

New B. F. Goodrich grommet V belts cut costs 20 to 50%

NO—a grommet is not an ordinary cable. It is a patented construction in which heavy cord is wound upon itself to form an endless loop. An ordinary cable is merely a twisted cord, the ends of which must be overlapped to make a loop. (See the picture above.) The difference is important to you, because a B. F. Goodrich grommet V belt delivers 20 to 50% more V belt value *at no extra cost.*

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Grommet V Belts BY

B.F.Goodrich

Behind the Scenes...

Gross Statements

One of the busiest of our crew of 40-odd editorial workers is Herbert Gross. He is also one of the largest, and certainly by all odds the tallest, standing 6'6". And despite the fact that he has been writing grist for our columns for several years, we've never seen him. You see, he's our correspondent in Germany. Those of you who have a vital interest in world markets know that STEEL carries a substantial volume of export market news each week. Regularly we receive reports from our eyes and ears in Europe's industrial centers, and just as regularly our news staff passes it along to you. One of these capable reporters is Herr Gross, who covers West Germany. He's an author, lecturer and public relations expert. Recently all the West German trade associations banded together in one central unit, and Herbert Gross was named to head all press and public relations activities. With that sort of contact in German industry, it is no wonder that STEEL's reports on the business there are factual, complete and authoritative. One of our correspondent's latest efforts is a book entitled, "The Marshall Plan, Germany's Chance", an analysis of what ERP means to his country. He also lectures on business, financial and economic subjects and does a good deal of writing for German periodicals on American economic trends and policies.

New Products Dept.

Toward the east end of our editorial section each week the editors run pictures and descriptions of new products. It's one of the best-read features of the book, probably because everyone likes to keep up on what's new, and of course in these cost-conscious days, you never can tell when somebody is going to bring out just the gimmick or gadget or machine you've been looking for. Since that type of editorial material seems to have a big pull with readers, we've decided to inaugurate a new products section for this column. Probably won't last more than this one issue, but it may be from time to time that we'll want to include more new products of unquestioned value to the metalworking industry. This week we have an able assist from the *Postage Stamp*, which has kindly listed some amazing new developments for us. One of these is a Yakety-yak. It's a set of realistic mock false teeth with a wind-up motor that causes them to open and shut rapidly while saying "yakety yakety yakety yak". We feel this is definitely an aid to overworked metalworking executives. Placed securely on the desk and released, this new development practically guarantees the end of any interview. Then there's a bottle opener which is a dead ringer for a real pretzel. Slipped into the pretzel bowl, this item will most certainly create demand for dental work, which will in turn require more dentists, which will boost the business of such dental equipment makers as the Ritter Co., who read STEEL. See how even the most innocuous item is important to us?

Prices Right

Bales of mail have been dumped on the editors' desks during the past couple of weeks, letters which talk about the new price section. Well, we told you so. We knew you would like it. But just the same, being more or less human, we like to find out that we're right. So thank you, one and all, for the fine response. The new price service is here to stay, will be continued, and will probably be expanded. Glad you liked it.

Back Fifty

Just fifty years ago a Pittsburgh steel company was awarded a contract for 3000 tons of steel for a new palace for the Emperor of Japan. Great excitement reigned in Pittsburgh over the news that the Carnegie Steel Co. decided to build two new blast furnaces, fourteen new open hearths, a bridge over the Monongahela to carry hot metal, and a new reversible blooming mill. Cost estimates ranged upward of $6,000,000. And on the lakes a new freighter, 505 feet long, was contracted for at a cost of $405,000. Leaders of the industry in New York warned that such prices are dangerous, that they must not be allowed to continue or our entire economy will be upset. Pig iron was quoted at $23, steel sheet at 3.35c. Strangely enough, that's about today's price for hot rolled sheets, and the OPA ceiling on pig iron resulted in a $23 price less than five years ago!

Shrdlu

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STEEL

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IT'S A GREAT SHEET *for Painting*

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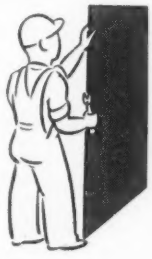
Paint "clings" firmly to the surface of Continental's GALVANNEALED sheet. No weathering, no special preparations are necessary to prepare it for painting. Fine finishes may be applied immediately after cleaning.



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with one of these 9 HAYNES hard-facing alloys

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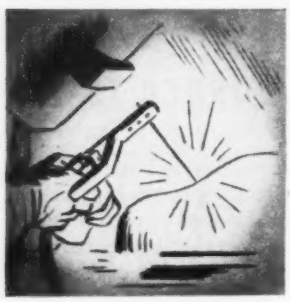
HAYNES hard-facing alloys are easy to apply by all welding methods:

OXY-ACETYLENE

Smooth sound deposits can be made by both manual and automatic methods with HAYNES bare rods.



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Flux-coated rods, available in practically all grades, provide a steady, quiet arc

"HELIARC" WELDING

This new process provides another fast method for depositing HAYNES bare rods.

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HAYNES STELLITE Alloy Grade 6: The toughest and strongest of the cobalt-base alloys. Recommended for coating surfaces subjected to mechanical or thermal shock. Produces sound deposits that will not check or crack.

HAYNES STELLITE Alloy Grade 12: A hard, wear-resistant alloy that is tough enough to withstand shock and impact. Recommended for coating large areas where deposits free from checks or cracks are required.

HAYNES Iron-Base Alloys

HAYNES Alloy 90: Highly wear-resistant. Resists oxidation and retains much of its original hardness at temperatures up to 1,000 deg. F. Withstands moderate impact.

HAYNES Alloy 92: A moderately low melting point rod. Use it on thin sections where low-temperature deposition is necessary to prevent distortion and on large parts when preheating is difficult or impossible. Deposits have a hardness of Rockwell C 65.

HAYNES Alloy 93: Gives excellent service where high cold-hardness is necessary. It is suitable for applications involving abrasion from sand, gravel, mill scale, or other hard particles.

HASCROME Rod: A work-hardening rod, recommended for use under conditions of severe impact. It is widely used for hard-facing rock and earth handling equipment parts. Recommended for electric application to manganese steel.

HAYNES Tungsten-Base Alloys

HAYSTELLITE Cast Tungsten Carbide: The hardest of all HAYNES hard-facing alloys, used where utmost resistance to abrasion is required. Typical applications include oil-well drilling tools, ditcher teeth, and coal undercutter bits.

HAYNES Nickel-Base Alloys

HASTELLOY Alloy C: Recommended for building up wearing surfaces of hot-working steel mill parts such as hot shear blades, entry guides, and shafts.

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STEEL

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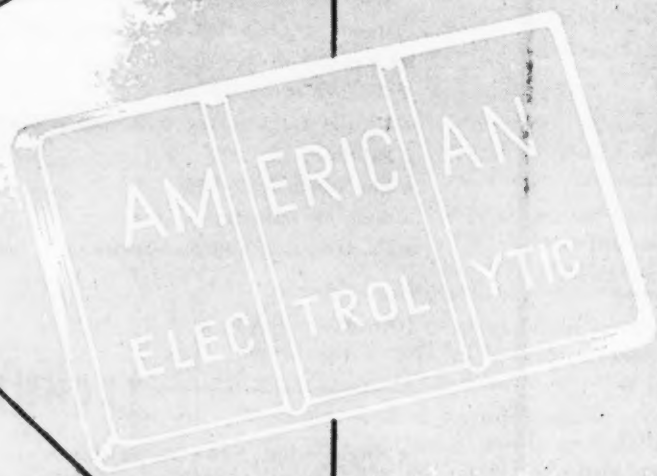

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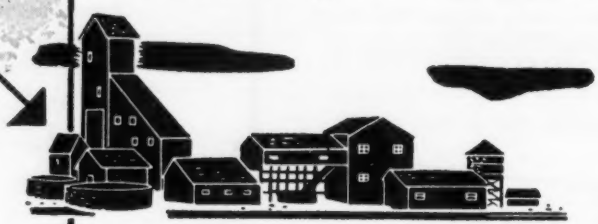

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October 3, 1949

The Human Element

At the 306th regular meeting of the National Industrial Conference Board its president, John S. Sinclair, made some pertinent remarks about the relation of expansion in industrial output and plant equipment to the nation's standard of living in the future.

Mr. Sinclair pointed out that in the decade just ending "we have had the greatest expansion of physical plant in our history . . . .yet our increase in productivity for this decade was the worst we have ever known." As to why productivity has lagged, Mr. Sinclair suspects that "we have failed to gain the active and positive co-operation of the human element in the productivity equation. Productivity results from a combination of materials, tool power and men. Human input grudgingly given can offset the entire expansion of all of the other physical elements in the process of production."

This line of thinking is important and timely in view of the present wave of labor disputes in several of our major industries. In fact, it prompts a number of fundamental questions. Must we continue to expend large sums of money for the physical expansion of plant and equipment with little hope that the "active and positive co-operation of the human element" will improve? What within reason, if anything, can be offered to win the "active and positive co-operation" so urgently needed?

This brings us to the subject of incentives, which embraces wages, working conditions and the phases of social security on which employers and unions have been trying to reach agreement in recent weeks. If there could be more tangible encouragement that some of the increased benefits now annually negotiated in union contracts eventually would lead to a wholesome gain in productivity, then it would be possible for employers and the public to approach the entire problem of compensation in all its phases from a more constructive angle.

In short, once the nation gets through its present labor emergencies, it might be well to devote more intensive study to the question of just what is required to rewin and hold the enthusiastic "co-operation of the human element in the productivity equation." Such study might demonstrate that compensation, including social security, is only an important detail in a much larger problem.

* * *

ANOTHER ENCROACHMENT: A seemingly innocuous news dispatch from Washington states that the Department of Commerce soon will start publication of a slick-paper, quarterly periodical on iron and steel. Its editorial content will include statistics, news of expansion and reports on technological developments in the industry. Subscription price has not been announced.

Birth of this particular government publication is of little moment but the principle involved is tremendously important. The iron, steel and metalworking industries today are much better served by existing information agencies than are any other related groups of industries. The publication you are reading now is but one of scores of privately published periodicals which serve readers in this field. The American Iron & Steel Institute is but one of many trade associations which disseminate statistical and other information. American Society for Metals and the Association of Iron & Steel Engineers are typical of dozens of technical societies which publish thousands of tech-

(OVER)

nical papers dealing with every phase of technological progress.

Are the information services of these hundreds of agencies so inadequate that the government must publish a periodical to fill an unserved need? If so, then it would be even easier for the government to say that manufacturers of automobiles, yeast cake or mouse traps are not serving their fields satisfactorily and that the government should go into the business of making these items.

There is no justification whatever for thousands of the government's excursions into the realm of private business. —p. 48

* * *

A DANGEROUS PROPOSAL: Some Washington observers are surprised at the lack of forceful opposition to the "antimerger" bill. The bill has passed the House and the Senate judiciary subcommittee handling it probably will report it favorably to the full committee.

Only a few businessmen appeared at the subcommittee hearings to oppose the bill. They declared that under its provisions it would be hazardous for anybody to buy out a business which the owner wanted to sell when he no longer could compete effectively, when he wished to retire or when his estate had to be made liquid for tax purposes. The result would be that a seller would have to suffer a terrific loss on the business he had created. Proponents of the bill, while admitting it would create difficulties for small businesses, say the way to solve this problem is to revise the tax laws.

In view of the admitted injustices the proposed law would impose, it is obvious that the bill deserves much more attention than it has received to date. —p. 46

* * *

MORE RAPID PROGRESS: In the fourth and concluding installment of the article on "Production of Pig Iron," the author, B. M. Stubblefield, Youngstown Sheet & Tube Co., states that although the art of blast furnace smelting has been changing continually since its earliest history, the changes have been only refinements of the basic process employed in central Europe during the middle of the 14th century.

Among the more recent refinements are increased size of stack, added moisture in the blast, oxygen enrichment of the blast, increased top gas pressure and more careful selection and sizing of raw materials charged into the furnace. Mr. Stubblefield believes that in the light of present day knowledge of furnace reactions, even more rapid progress in increasing production and economy of blast furnace operations may be expected in the future. —p. 84

* * *

REDUCES BACKTRACKING: After the war, Sheffield Steel Corp. began shipping skelp from its Houston mill to A. O. Smith Corp. at Milwaukee for fabrication into pipe. Much of the pipe then was shipped back to Texas for the oil and gas industry.

High freight rates and the government's edict against freight absorption make such backtracking increasingly unattractive. Therefore A. O. Smith Corp. and Sheffield Steel Corp. have formed the A. O. Smith Corp. of Texas to build a $5 million plant at Houston to produce flash welded steel pipe for gas and oil transmission and oil well casing. Half of the stock in the new company is owned by each of the parent companies.

The new plant will be adjacent to the Houston works of A. O. Smith and the Houston mill of Sheffield and can use rail and water transportation. Here is a clear-cut case of moving facilities to the market. —p. 45

* * *

BIG GAINS IN DECADE: Comparison of certain statistics for the first three quarters of 1949 with figures for the same period of 1939 shows how spectacularly the economy of the nation has expanded during the past decade.

While population has increased from 131 to 150 million, a gain of 14.5 per cent, other measures of economic growth have increased by an even larger margin. Employment is 31.3 per cent greater. Steel ingot output is up 94.6 per cent. Automobile production is 92.3 per cent higher. Despite curtailed mining operations this year, coal output for the first three quarters is 25.9 per cent greater than in the comparable quarters of 1939. Electric power output is 134 per cent greater, construction 173.9 per cent higher in dollar value, exports 277.7 per cent greater and imports are up 158.9 per cent.

American business will spend an estimated $17.9 billion for new plant and equipment in 1949—a figure far outdistancing any prewar annual total. —pp. 39, 44

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

BUSINESS BETTER?—It has improved sensationally if you compare the three quarters just completed with the same span in 1939 (p. 39). Production of ingots and autos has nearly doubled. Electric power output and construction volume has increased even more. Exports are nearly four times greater and imports are two and a half times above the first three quarters of 1939. Coal production and freight car loadings are up. Employment is 31.3 per cent higher, but the population has increased only 14.5 per cent.

FOREIGN—Western Europe is trying to fight another round of inflation, expected as one result of currency devaluation (p. 49). Britain is intensifying its campaign to hold the price line. France fears that the slight rise in the cost of living, accentuated by devaluation, will strengthen the Communist position in the autumn wage drive. Belgium had more imports than exports in August for the first time in three years. Western Germany is looking for oil near the Dutch border.

HEAVY EXPANSION—Despite economic uncertainties American business will spend an estimated $17.9 billion for new plant and equipment in 1949 (p. 44). This is $1.3 billion less than that spent in record 1948, but $1.7 billion more than was spent in 1947, second best year thus far . . . To maintain our high standards of living, our productive plant and output must be expanded still more, says John S. Sinclair, president of National Industrial Conference Board (p. 44).

RAIL FREIGHT CUTS—Watch the competitive battle shaping up between railroads and trucks in the Chicago area (p. 42). Several railroads operating in the Chicago switching district have filed for rate cuts because of truck inroads on their freight volume.

THIS MILL GOES TO MARKET—Another move to study which relates to the high costs of transportation is that taken by A. O. Smith Corp. and Armco Steel Corp's Sheffield Steel Corp. (p. 45). Smith and Sheffield have formed a new company, A. O. Smith Corp. of Texas, to build a $5 million mill at Houston which will make pipe for oil and gas lines. Here the mill goes to market to take advantage of the increased significance of high freight costs in today's manufacturing.

MERGERS—If you're planning any business mergers soon, you may have to reckon with stricter controls should legislation now pending in Congress be passed (p. 46). Surprisingly little opposition has risen to the measure which tightens up a Clayton Act loophole permitting mergers by acquisition of corporation assets.

ATOM BOMB—Look for chain reaction stemming from the Russian atomic blast which will affect the metalworking industry soon (p. 43). Congressional action will be speeded on two programs with which industry is concerned: Military aid to Europe and the Point Four plan to help underdeveloped areas. The military may have an easier time getting appropriations from now on.

AIDS TO INDUSTRY—These developments may aid in sustaining or improving business volume: ECA is starting a program to help the small independent firms get Marshall Plan contracts (p. 42) . . . A hospital construction program is gaining momentum, and metalworking companies are getting more than half of the $225 million being spent annually (p. 43) . . . Boom in liquefied petroleum gas production aids metalworking whose products are essential in production, marketing and use of the fuel (p. 50).

COMPANY RESEARCH—Steadily increasing importance of research and development in industry is indicated by announcement of new or expanded research plants for General Motors Corp. (p. 40), United Engineering & Foundry Co. (p. 56) and Carbide & Carbon Chemicals Corp. (p. 56).

Engineering News, p. 67 *Market Summary, p. 115*

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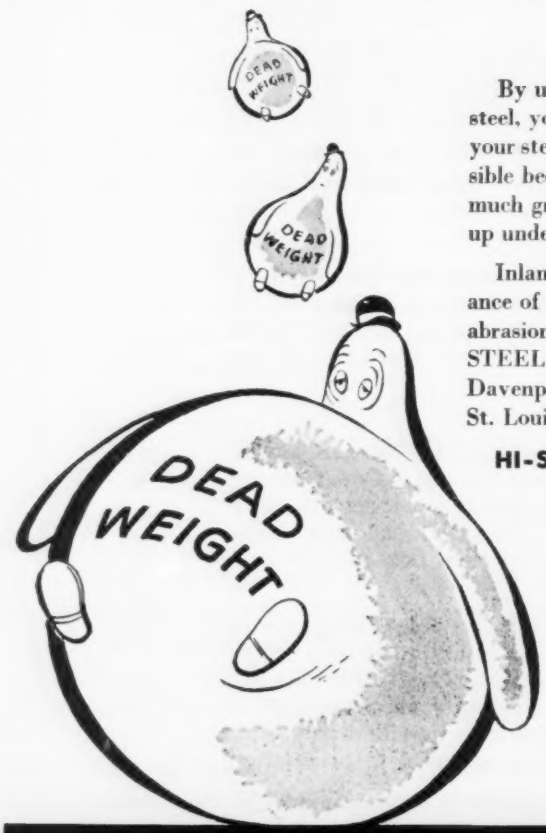
HI-STEEL reduces weight without sacrificing strength



By using Inland HI-STEEL instead of ordinary structural-grade carbon steel, you can reduce sectional thicknesses, minimize dead weight, and cut your steel requirements as much as 25% per unit of production. This is possible because HI-STEEL's high strength-to-weight ratio permits the use of much greater unit stress in design . . . and has 50% greater ability to stand up under impact loads.

Inland HI-STEEL has about five times the atmospheric corrosion resistance of ordinary structural-grade carbon steel, and is far more resistant to abrasion. It can be easily worked hot or cold. Write for booklet. INLAND STEEL CO., 38 S. Dearborn St., Chicago 3, Ill. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

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INLAND HI-STEEL

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THE LOW ALLOY HIGH-STRENGTH STEEL

STEEL
A PENTON PUBLICATION

Slump? It's Boom by 1939 Levels

Sensational production gains shown in first three quarters of 1949, compared with the same 1939 span. Employment up 31.3 per cent, population rises 14.5 per cent

BUSINESS better? Take a look at the accompanying chart comparing the first three quarters of 1949 with the same span in 1939 and judge for yourself.

Metalworking industry has completed three-fourths of 1949—a period already filled with a yearly quota of labor trouble and business ups and downs—but production in many lines is nearly double that for the same nine months of 1939, a good prewar year. Output of ingots and steel for castings thus far this year is 94.6 per cent greater than for the corresponding period in 1939. Auto production is 92.3 per cent higher. Employment is up 31.3 per cent. Population has increased 14.5 per cent.

Coal Production Ahead—Further comparisons show bituminous coal production in the first nine months of this year was 26 per cent ahead of that for the corresponding period of 1939 even though mine production in 1949 has been choked back by miners' refusal to work a full week. Production in the first nine months of 1949 was 335,385,000 tons; in the like period of 1939, 266,519,000 tons.

Reflecting part of the widespread increase in home and industrial use of electricity, electrical energy production totaling 212,161,192,000 kwhr in the first nine months of 1949 was 134 per cent over the 90,648,532,000 kwhr produced in the corresponding period of 1939.

Carloadings Up—The higher level of industrial production this year put railroad freight car loadings in the first nine months 14 per cent above that for the like period of 1939 even though railroad freight business has been hurt in 1949 by increasing freight rates and adoption by some of the nation's big industries of f.o.b. plant pricing, under which the customer pays the freight. The rate boosts and the pricing system change have both diverted freight tonnage to trucks and water carriers. The excess of tonnage carried in 1949 over that of 1939 probably is greater than is indicated by the numerical gain in cars loaded, for average capacity of a freight car has been increasing. In 1948 it hit a new peak of 51.9 tons. In 1939 it was 49.7. Cars loaded with revenue freight in the first nine months of 1949 totaled 27,791,856, compared with 24,425,725 in the like period of 1939.

Construction Gains—Also up is dollar volume of construction in the 37 states east of the Rocky mountains Awards in the first nine months of 1949 total an estimated $7,216,984,000, compared with $2,634,800,000 in the corresponding period of 1939. Even after making allowances for inflation the volume this year is considerably ahead of ten years ago.

Not only is more business being done at home but our trade with foreign countries in the first nine months of 1949 has been substantially ahead of that for the like period of 1939 despite dollar shortages abroad. Exports from the United States in the first nine months of 1949 averaged around $1 billion a month, compared with a monthly average of $264,750,000 in 1939, and imports to the U.S. in the first nine months of 1949 averaged $500 million, compared with a monthly average of $193,166,666 in 1939. Even after allowing for monetary inflation the physical volume of goods in the 1949 trade is substantially above 1939.

Population Up—Paralleling the surprising gain in production is a rise in population. Bureau of Census reports the United States population has passed the 150 million mark. This exceeds by between 3 million and 13 million predictions made ten years ago for 1950. Rising birth rate and greater life expectancy explain the phenomenon. A man 35 can expect to live to be 70 in contrast to 68 about ten years ago. Nearly 7.7 per cent of the U. S. population is now 65 or over compared with 6.9 per cent in 1939. An estimated 13.4 per cent will be in that category by 1995.

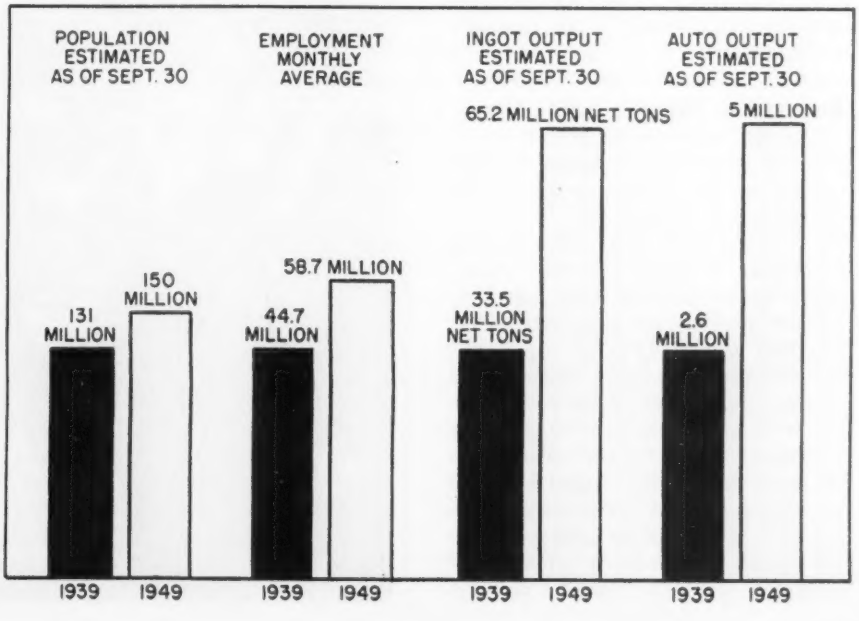
Rising age level in this country is already having a profound influence on the metalworking industry. Age of the buyer has a bearing on the design he prefers for his automobile and other consumer products. Middle aged persons—and there are proportionately more of them now than before the war—have greater purchasing power than those in their twenties and thirties. The labor force's average age is rising, one of the factors behind demand for more social insurance and pensions.

Expansion Phase Coming?—Spurt in U. S. population, which is expected to continue, supports the belief that this country may be on the threshold of an economic expansion like that of 1870-1880 when population rose 30 per cent.

Cost of Living Up

Consumers' price index of the Bureau of Labor Statistics rose 0.2 per cent from mid-July to mid-Au-

Economic Indicators for First Three Quarters of 1949, 1939



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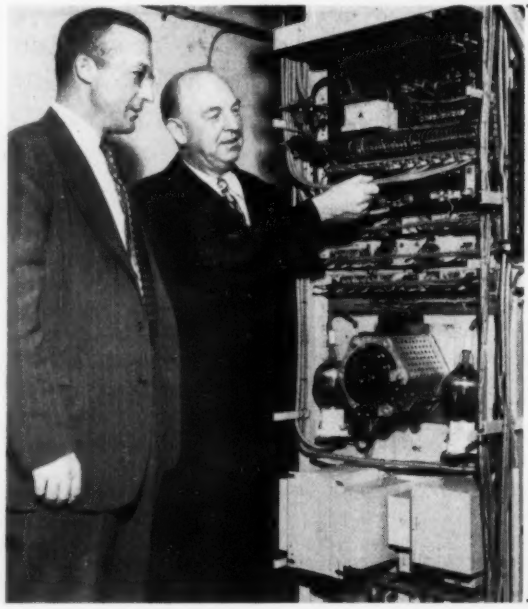

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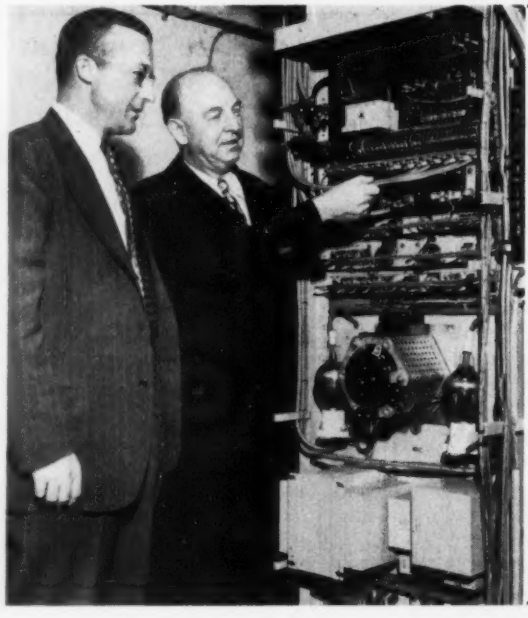

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Boon for Small Business

Details of ECA program to help little independent firms get Marshall Plan business

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He appointed Bert M. White to head ECA's Office of Small Business to carry out the program. When completely in operation, it will provide small independent firms with:

1. A counseling service in exporting under the Marshall Plan; 2. information of potential purchases to be made in the U. S.; 3. names and addresses of European importers and products they have purchased under the Marshall Plan; 4. information about commodities that offer the greatest opportunities for sales in Western Europe; and 5. a directory with names and addresses of potential American exporters—by commodities.

The directory will be for overseas distribution and will be available through ECA overseas missions to European importers seeking additional American sources of supply.

Follows Congressional Directive—Announcement of the program came after several months' study to develop methods to meet a congressional directive that called for furnishing small business with information about proposed ECA-financed purchases. The program will give small independent firms a better chance to supply goods for European recovery. Almost 70 per cent of all ECA dollars, incidentally, are spent for goods from the U. S.

Mr. White has been serving as small business consultant to ECA for several months. He has been exploring methods in this country that would answer the small business amendment to the original ECA Act. He has agreed to serve for six months. He originated his Research Advisory Service to aid small manufacturers in his 15-year tenure as vice president of the Liberty Bank of Buffalo. This later was adopted by many other banks and by power companies in the country.

Seek Data on Purchases—The most difficult task, he said, would be to compile definite information on possible European purchases. He added that preliminary conversations already have been held abroad to obtain detailed information of purchases of each Marshall Plan country.

"The small business man still will have to sell his product in these markets," he said, "but we hope to be able to help him direct his sales efforts in channels where tangible results are possible. His success will depend on his product, its competitive price and performance, his service setup and how well he has organized for export."

You should remember that ECA is a financing agency and does not buy or sell.

Better Mousetrap Arrives

The world may start beating a path to Britain's door after all.

Among specialty items from Great Britain listed with the U. S. Department of Commerce as American import opportunities is a newly designed mousetrap, International Trade Office reports.

It is described by its sponsor as all metal, rustproof, self-setting and hygienic. It is guaranteed to put an end to trapped fingers. It is one of many foreign offerings listed in this week's issue of the department's Foreign Commerce Weekly.

OIT also announces availability of these products by British companies: Bicycle chains, herring, water leak detectors, medical and industrial stethoscopes, sea moss, dental burrs, silverplated reproductions of old Sheffield plate, telegraph undulators, impulse recorders and cycle recorders for electric welding.

Also offered are world patent rights to a new type coal cutter, loader and excavator.

Packaged Savings for Users

PACKAGING technique for fasteners introduced by National Screw & Mfg. Co. results in 5 to 7 per cent savings for the Cleveland company's customers.

National's hardware packing cuts costs to users by reducing stock handling, warehousing and shipping expense. Hardware packing is destined for jobbers and distributors who deal in small lots with hardware stores and industrial companies whose fastener buying volume is not large.

The method, adopted early this year and widely followed by other fastener manufacturers, makes use of a carton containing separately wrapped packages which can be removed without repacking the carton. Weighing 25 to 30 pounds, each carton contains one size and type of product. All sizes of carriage, machine and lag bolts and cap screws can be packed in this way.

Hardware packing won't supplant standard case packing which still is the best method for purchasers buying in large lots direct, but it will supplement the older technique.

Rail Freight Cuts

To meet truck competition asked by line operating from Chicago switching area

MOTOR carrier competition in the movement of iron and steel products is forcing several railroads operating in the Chicago switching area to cut rates.

To meet the threat, several lines are following lead of the Chicago, Rock Island & Pacific in filing notices of downward rate revisions on 80,000-pound minimum weights. The Chicago switching district includes Gary to Peoria, Moline, Rock Island and Springfield, Ill., and Davenport and Bettendorf, Iowa.

Present rates are 32 cents per 100 pounds to Peoria, 33 cents to East Moline, Moline, Rock Island, Davenport and Bettendorf and 34 cents to Springfield. These rates are based on a minimum weight of 40,000 pounds. The new schedule, which may become effective in early November, is 25 cents to the above-mentioned points, with the exception of Springfield on which the rate will be 26 cents per 100 pounds.

Rock Island officials, in announcing filing of the notice Sept. 22, said the revision is necessary because contract motor carriers, with rates ranging from 22.5 cents to 25 cents on hauls to the Quad-Cities and Peoria, are enjoying a substantially increased tonnage.

Republic Asks Lower Rail Rates

New and lower railroad freight rates for iron and steel products destined for Minneapolis and St. Paul have been proposed and docketed with the Western Trunk Line Committee by Republic Steel Corp. The proposed rates would permit the railroads to be more competitive with other types of carriers and would follow closely lower rates already approved by the committee for shipment of certain steel products from Sterling, Ill., to the Twin Cities.

Republic's proposal advocates a reduction in the present rate of 64 cents per 100 pounds on a minimum weight of 60,000 pounds to 31 cents and would apply on shipments from the Chicago district, Peoria and Granite City, Ill.

Russian A-Bomb Blast

Speeds legislative action on North Atlantic military aid and Point Four programs

RUSSIA's atomic blast did more than start the Geiger counters turning. A chain reaction started by the explosion may have a heavy impact on American business. Although it is impossible immediately to assess all the effects, the President's announcement started legislative wheels to grinding out measures to strengthen our domestic and foreign position.

Military May Get More—There is no indication that either the Administration or Congress will start a breakneck rearmament program, but the military departments will probably have an easier time getting their appropriations approved. The aircraft industry should reap the greatest benefits.

Word has gone out that all plans connected with defense must be overhauled in light of this new development. Departments and agencies are scanning anew the 1951 budget requests which they will present to the Budget Bureau.

Budget Requests To Rise—Bureau of Mines' request for substantial increases for development of domestic manganese and chromite and for continuing work on other metals, notably titanium and zirconium, will probably get early approval. Atomic Energy Commission's spending is expected to be boosted from the present $700 million. Particular attention will be paid to research on atomic missiles that could be delivered accurately against selected targets.

President Truman is understood to be giving intensified attention to filling vacant chairmanships of Munitions Board and NSRB.

MAP Speeded—House-Senate conferees agreed to accept the Senate's terms for supplying arms aid to North Atlantic Pact countries and other friendly nations. The $1,314,000,000 figure agreed upon includes $1 billion for pact countries themselves. Cash appropriations for the first year total $500 million with another $500 million in contracts permitted but payments will be deferred until after June 30, 1950.

Both versions include $211 million for Greece and Turkey and $27.6 million for Iran, Korea and the Philippines. They also authorize transfer to foreign nations of $450 million in "excess" American military equipment. The conference group also went along with the $75 million grant for the "general area of China" included in the Senate bill.

Point Four Action Likely—Chances for early legislative action on the President's Point Four program for advancement of underdeveloped areas of the world are also improved. Before the Senate is the Maybank bill giving the Export-Import Bank power to guarantee U. S. investments abroad against: Inconvertibility of foreign currencies into dollars, confiscation, expropriation and physical destruction incident to war.

Two other measures for implementing the Point Four program are also before appropriate committees: One involves an appropriation of $45 million to finance technical assistance; the second proposes liberalization in taxes on incomes earned in foreign countries as a stimulant to American private investment.

State Department assures the House Foreign Affairs Committee it is intensifying its efforts to "secure treaties with other countries which will give greater confidence to investors. . . Treaties will seek assurance of nondiscriminatory, reasonable, fair and equitable treatment for our investors, no less favorable than that accorded to nationals of other countries."

HYDRO-BULGING: Bulges in aluminum cooker shells for electric ranges are made through a process developed by Hydraulic Press Mfg. Co., Mt. Gilead, O. A press seals a drawn shell in a die, hydraulic fluid under pressure of 2000 psi pushes the shell into the die, the desired bulge results

More Hospitals

Help metalworking industry. Big Cleveland show reflects $225 million building program

NATION's hospital construction program is gathering momentum and promises to gain full speed if legislation before Congress is passed to double the annual federal subsidies from $75 million to $150 million.

Metalworking's share in this type of construction is larger than for other varieties of public and residential building because of the large amounts of medical and electrical equipment required. Hospital construction has lagged since 1930 because of the depression, the war and postwar high costs. It now costs $15,000 to $16,000 per bed to build the average hospital, compared with $5000 per bed before the war.

Federal Subsidies Aid—Besides the veterans' hospital program which has been whittled down to small proportions, virtually all hospital construction in the past two years has been done with the aid of federal subsidies supplying one-third of the total cost.

The other two-thirds is furnished by state funds and private financing, so the federal-state-private program has been contracting for $225 million annually in goods and services.

More than half of this sum goes to the metalworking industry for structural steel, power machinery, heating apparatus, elevators, maintenance equipment, medical and surgical instruments, x-ray and other professional devices, control apparatus, laundries, kitchen equipment, food and other materials handling equipment, metal furniture and many other products.

Record Number Displays—More than 125 companies making these items had displays at the American Hospital Association's annual convention and show in Cleveland Public Auditorium, Sept. 26-29.

A record number of industrial firms participated. This showing reflects both the increased tempo of hospital construction and the greater need for metalworking products. A drive to cut operating costs is leading hospitals already built to install more automatic control equipment and materials handling devices. Demand for automatic office accounting machinery is mounting. Vertical construction in new hospitals is now more common, resulting in greater need for structural steel, elevators and related products.

Plant, Equipment Expenditures Dip

American business to spend $17.9 billion on new facilities this year, slightly under 1948 figure but second highest on record. Utilities, railroads spending more

AMERICAN business will spend an estimated $17.9 billion for new plant and equipment this year.

This outlay will be $1.3 billion, or 7 per cent, less than was spent in 1948, but will be $1.7 billion more than was expended in 1947, second highest year on record.

Total 1949 outlays for plant and equipment include $9.1 billion actually spent in the first six months and an estimated $8.8 billion being spent in the second half. Estimates are by the Securities & Exchange Commission and the Department of Commerce.

Expansion Costs Lower—Although the costs of capital expansion have been declining in 1949, expenditures for the last half indicate some falling off in the physical amount of plant and equipment purchased by business.

The federal agencies admit that the decline from 1948 may be overestimated due to incomplete reporting of longer-term investment programs and because fourth quarter accounting adjustments may raise reported expenditures for that period.

Utilities, Railroads Spend More—Electric and gas utilities and the railroads are spending more in 1949 than in 1948. All other major industry groups are spending less.

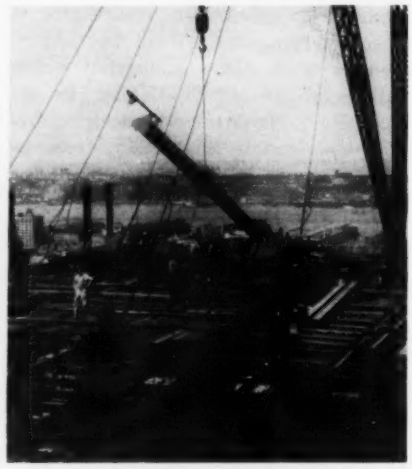
Railroads spent $170 million more in the first nine months of 1949 than in the comparable 1948 period. Fourth quarter expenditures are being curtailed sharply and the total increase for the year will be only about $40 million.

Electric and gas utilities are still increasing their expenditures and their total for the year will be $400 million greater than in 1948.

Manufacturing Curtails — Expenditures by manufacturing companies will be $220 million less than last year. Contraction in new plant and equipment spending was noted in the third quarter and is becoming more evident in the fourth quarter.

Mining will spend $60 million less. Transportation other than railroads will spend $160 million less than in 1948 and $260 million less than in their record year of 1947. Commercial and miscellaneous expenditures are down.

Comparative figures on spending by business classifications are contained in the table at bottom of page.



BUILDING SPEED: Structural steel work is being "topped out" in record time for the new 25-story home office building of Mutual Life Insurance Co. of New York at Broadway and 55th St., New York city. The steel, furnished and erected by Bethlehem Steel Co., rose at the rate of more than two stories a week. Turner Construction Co. is the builder

Austin Building Index Drops

Austin Co.'s index of industrial building costs dropped another five points to 161 (1926 equals 100) in the third quarter as a result of improvement in construction labor quality and availability of materials and equipment.

Current index figure is 7½ per cent below the October, 1948, peak and compares with the April to September, 1947, level.

George A. Bryant, Austin president, says, "This reduction in building costs has taken place in the face of scattered wage increases and the further small advance in freight rates.

"Stabilization of building costs at about the present level can be expected unless a recurrence of labor difficulties or wage and price increases upset the situation."

Needed: Expansion

Larger output and more productive plant needed if Americans are to retain present standards

OUR productive plant and output must be expanded, says John S. Sinclair, president, National Industrial Conference Board. Why such an assertion when the country just recently found itself sweating out a mild case of economic jitters called a recession?

Mr. Sinclair's explanation, in NICB's 306th regular meeting in New York, is that only through expansion of output, and possibly expansion of plant, can we continue our present standards of living, for the country's population increase means more people are drawing upon the output. An even further increase in physical plant is necessary, he believes, if we are to give future generations the tools to raise their planes of living at the rate achieved in the past.

Output First—Of the two—expanded output and expanded plant—the former can and must come first, Mr. Sinclair indicates. "We have had," he says, "the greatest expansion of physical plant in our history in the decade just ending.

"First, the government created its brand new industrial empire during the war.

"Next, private industry, primarily

Expenditures for New Plant and Equipment by U. S. Business

(Millions of dollars)

	1941*	1942*	1943*	1944*	1945	1946	1947	1948	1949†	1949 Jan.-Mar.	1949 Apr.-June	1949 July-Sept.†	1949 Oct.-Dec.†
Manufacturing	3400	2760	2250	2390	3210	5910	7460	8340	7120	1850	1880	1770	1620
Mining	680	410	360	500	440	560	690	800	740	190	190	180	170
Railroad	560	540	460	580	550	570	910	1320	1360	360	380	340	280
Other transportation	340	260	190	280	320	660	800	700	540	130	140	140	130
Electric and gas utilities	710	680	540	490	630	1040	1900	2680	3100	680	780	810	830
Commercial and misc.††	2490	1470	730	970	1480	3300	4430	5390	5080	1260	1290	1300	1240
Total	8190	6110	4530	5210	6630	12040	16180	19230	17920	4460	4660	4550	4250

* Figures for 1941-1944 are Federal Reserve Board estimates based on Securities and Exchange Commission and other data. These figures do not agree precisely with the totals included in the gross national product estimates of the Department of Commerce. The main difference lies in the inclusion in Commerce figures of certain outlays charged to current account. † Estimates based on anticipated capital expenditures of business. †† Includes trade, service, finance, and communication. NOTE: Figures are rounded and will not necessarily add to totals.

through use of retained earnings and war-accumulated reserves, spent even greater sums for the same purpose.

Productivity Increase Small — Yet our increase in productivity for this decade was the worst we have ever known." Why? Mr. Sinclair suspects we have failed to gain the active and positive co-operation of the human element in the productivity equation. "Productivity results from a combination of materials, toolpower and men. Human input grudgingly given can offset the entire expansion of all of the other physical elements in the process of production. If the field of human relations in industry including incentives, the cultivation of co-operation, the stimulation of worker morale, continues to lie fallow or insufficiently cultivated, all the billions we pour into toolpower may become virtually neutralized," Mr. Sinclair explains.

Public Housing Booming

Many communities are rushing plans to get aboard the low-rent public housing program authorized by the Housing Act of 1949. The Public Housing Administration already has approved applications involving 9000 of the 810,000 dwelling units authorized to be built with federal assistance over a period of six years.

The cities thus favored are Johnstown, Pa., Paterson, N. J., New Haven, Conn., Beaumont, Tex., Waco, Tex., Denver, and San Francisco. They have requested loans totaling $1,765,000 to plan their housing projects. After the units have been erected, the PHA will contract to pay annual contributions to the projects. This subsidy, together with local tax exemption, will make it possible to set rents low enough to be within the means of low-income families.

Grain Storage Improvements

Fundamental principles in grain storage construction and recent improvements in the design and construction of mechanical equipment for drying corn with both heated and unheated air are discussed in two reports now available from the Department of Agriculture.

They are identified as Farmers' Bulletins Nos. 2009 and 2010. They are aimed at construction of such facilities on farms on the theory that "planning long-term livestock industries calls for adequate reserves of corn and other food grains at all times" and "the reserves can best be protected on the farms where they are produced." Hence, the potential market for such storage and drying plants is seen as a large one.

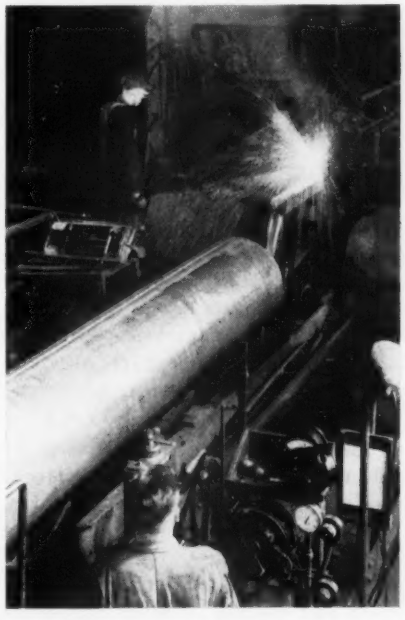
Mill Goes to Market

A. O. Smith and Sheffield Steel to build $5 million pipe mill at Houston

ONE WAY to remain competitive is to produce your product as near as possible to your customers. If ever there were a time this were true it is now with freight rates up considerably and with many industries, in deference to government edict and attitude against freight absorption, leaving the freight payment up to the customer.

Recognizing the new significance of the freight factor, the A. O. Smith Corp., Milwaukee, and Sheffield Steel Corp., wholly owned steel-producing subsidiary of Armco Steel Corp., Middletown, O., have formed a new company, A. O. Smith Corp. of Texas, to build a $5 million mill at Houston to produce flash-welded steel pipe for gas and oil transmission lines and oil well casing in the heart of a big consuming area, the Southwest's petroleum and gas fields. Half of the stock in the new company is owned by A. O. Smith Corp. and the other half by Sheffield Steel Corp.

Natural Partnership—A. O. Smith will furnish know-how in producing pipe and Sheffield Steel Corp., which has a plant at Houston, will provide steel. After the war Sheffield began shipping skelp to A. O. Smith at Milwaukee where it was made into pipe. Much of it was then shipped back to Texas for the oil and gas industry. Officials of the two companies decided to simplify this process by setting up the jointly owned pipe mill. The new plant will be adjacent to both the Houston works of A. O. Smith Corp. and the Houston mill of Sheffield Steel and can use both rail and water transportation.



New Texas mill to flash weld pipe

Officers of A. O. Smith Corp. of Texas will be A. Von Wenning, chairman of the board; L. B. Smith, president; John M. Floyd, vice president; D. F. McCarthy, vice president and general manager; and M. J. Vollmer, secretary and treasurer. All are officials of A. O. Smith Corp., Milwaukee. Directors will include R. L. Gray, Sheffield Steel president; J. C. Shepherd, executive vice president of Sheffield; L. H. Juengling, Sheffield secretary; F. Ray McFarland, Sheffield Houston division manager; Mr. Smith; Mr. Von Wenning; Rae F. Bell, board chairman of A. O. Smith Corp.; and W. C. Heath, president of A. O. Smith.

Construction Starts—Construction of the new plant will start at once, completion being expected in the summer of 1950. Line pipe to be made by the plant will be in 40-foot lengths ranging in diameter from 8 5/8 inches to 30 inches and larger, if required. The plant's monthly capacity of pipe will be from 30,000 to 35,000 tons.

The new mill will provide for the first time a main source of oil and gas pipe in the heart of the southwestern petroleum area where large amounts of large diameter line pipe and oil and gas well casing are used. Texas has been dependent on distant plants for this pipe.

Steel Capacity Increased — Sheffield's Houston plant is the only producer of open-hearth steel in Texas, closest other such plants being at Birmingham, St. Louis, Kansas City, and Pueblo, Colo. Its construction was begun in 1941, and during the war it supplied large quantities of steel for Gulf Coast shipbuilding and for other war purposes. By 1943 original capacity had been doubled, and expansion has been continuing; capacity now is three and one-half times what it originally was.

The new pipe mill will not affect Sheffield's ability to supply the wide variety of steel items which it ships to other customers, and likewise it will not affect present Houston operation of A. O. Smith Corp., company officials assert. The present A. O. Smith plant on the Houston Ship Channel was bought from the government after the war and makes pressure vessels, liquefied petroleum gas systems and vertical turbine pumps. From 1000 to 1500 jobs will be created at the new mill and Sheffield Steel.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Lack of opposition to "antimerger" bill is puzzling to Washington observers. Grave new problems will confront American business if bill becomes law

CAPITOL observers are puzzled by the lack of opposition voiced against the so-called "antimerger" bill—especially since grave new problems will confront American business if the bill becomes law.

Right now it stands a good chance of adoption: The House has passed it; indications are that the three-man Senate judiciary subcommittee handling it will line up two to one for reporting it favorably to the full committee. Only a handful of businessmen appeared at subcommittee hearings to point out the bill's defects.

The antimerger bill has been recommended to Congress by the Federal Trade Commission since 1927 when the commission discovered that, through a loophole in Section 7 of the Clayton Act, mergers affected through acquisition of the assets of a corporation could not be questioned. The law placed a ban only on mergers through acquisition of stock. But the bill to correct this loophole seems to go much further than is necessary for this purpose. Witnesses told the Senate group that the bill actually appears to cloak an attempt to obtain full government control over the growth and development of all American industry.

"If the bill is passed," declared Karterine Parsons of the Pennsylvania Manufacturers Association, "every bill of sale of corporate assets would have tacked to it an implied condition subsequent—'Subject to defeasance at some later date by the varying interpretations of the changing personnel of the Federal Trade Commission.' "

The business complaint against the bill is that it would make it hazardous to buy out a business which the owner wanted to sell when he no longer could compete effectively, when he reached the retirement age, when his estate had to be made liquid for tax purposes, etc. Business spokesmen pointed out that because of the stifling effect of existing tax laws, there is a great scarcity of venture capital, so that the only market for business offered for sale is to be found among competitors, particularly large interests. The bill would remove this remaining market, they said, with the result that owners offering businesses for sale would be unable in many cases to recover anything approaching the true assets value which they have created.

John Blair, assistant chief economist of the FTC admitted that the bill, "in certain instances will impose hardships on small or medium-sized concerns, and it seems a choice in public policy has to be made." Mr. Blair said that when the hardship of the individual business man is weighed against the general good to the public, the good of the public must prevail.

Senator O'Mahoney (Dem., Wyo.) also admitted that the bill would create difficulties for a small business that wanted to sell out, but he maintained the right way to bring about a good market for such businesses is to revise our tax laws as to encourage venture capital.

The powers that the bill would give to the FTC are suggested by the section under which acquisition of the assets of a business would be unlawful "where in any line of commerce, in any section of the country, the effect of such acquisition may be substantially to lessen competition, or tend to create a monopoly."

The subcommittee in charge of the bill consists of Senators O'Conor (Dem., Md.), Kilgore (Dem., W. Va.) and Donnell (Rep., Mo.). Senator O'Conor is chairman. The first two men are expected to vote for a favorable report on the bill; Senator Donnell is expected to vote against it.

Survey Reveals New Ore

IRON ORE survey launched by the United States Geological Survey in 1943, when heavy depletion of the open-pit reserves in the Lake Superior district was causing widespread fears of a future scarcity, already has revealed the presence of large bodies of iron-bearing material whose existence had not been previously known.

These discoveries, made possible by the use of advanced geologic techniques like magnetic mapping, are being used as prospecting guides by companies owning properties in the covered areas. Already in use are maps and reports on seven iron-bearing locations on the Menominee range in Iron and Dickinson counties, Michigan.

Similar studies are scheduled for the Marquette range in Michigan, the Penokee-Gogebic range in Michigan and Wisconsin, and the Mesabi, Vermilion and Cuyuna ranges in Minnesota. The Lake Superior survey laid out as a 20-year project is due for completion in 1963.

Other iron ore surveys are well under way, principally in the Adirondack section of New York state, in the Iron Springs district in Iron county, Utah, and on the Laramee range in Wyoming. The programs include detailed geologic mapping and magnetic maps which will inform prospectors which spots can be drilled with promise of worthwhile finds. The study in Utah will require one or two years more to complete; those in New York and Wyoming are nearing completion. The Wyoming ore, incidentally, is titaniferous: It contains more than 1 per cent titanium in addition to iron.

Survey's Mineral Deposits Branch is at work on a color map which will show iron ore locations in the U. S.

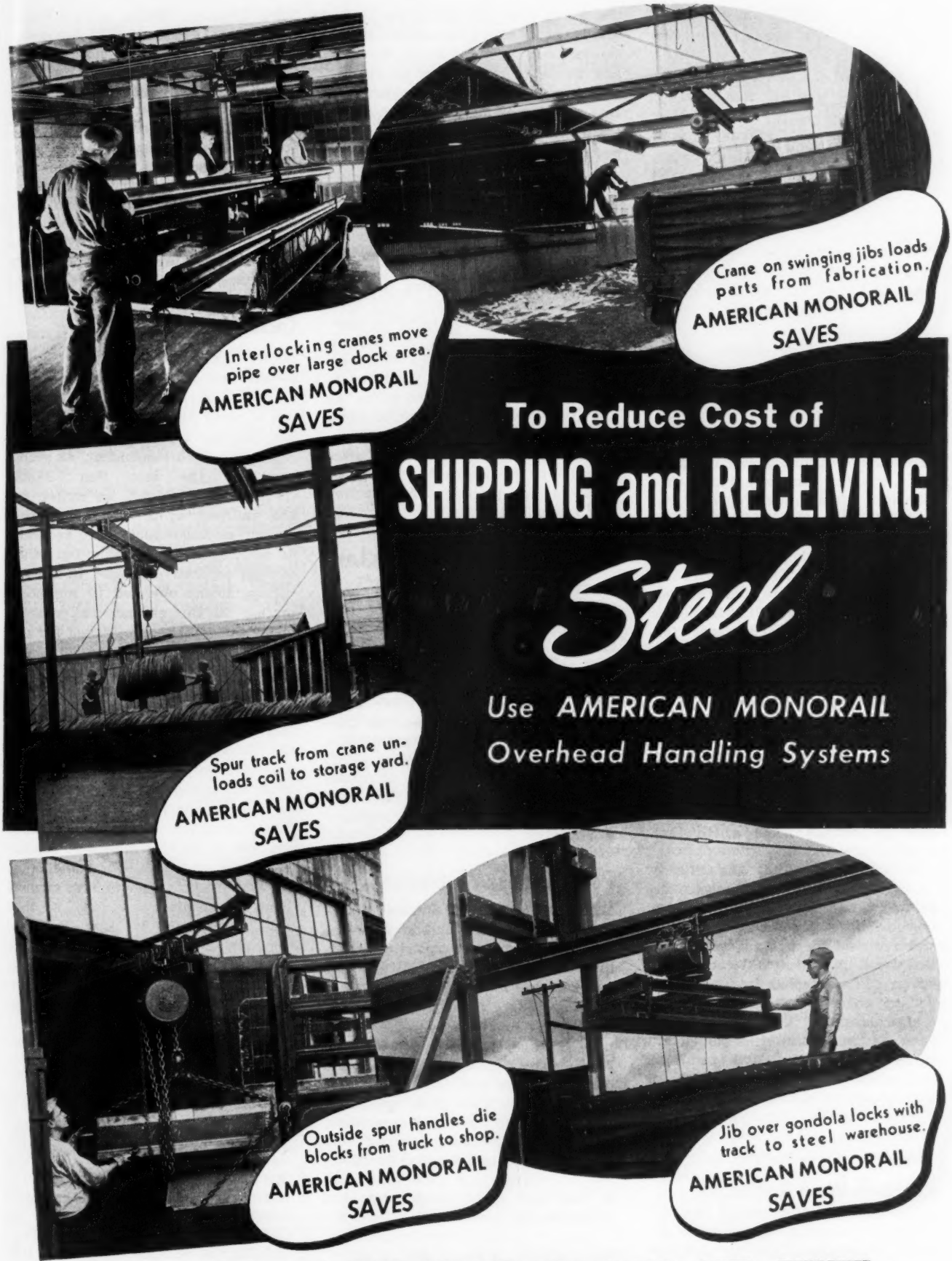
New Service: MSTS

NEW UNIFIED Military Sea Transportation Service was formally established last week with the assignment of 94 naval vessels to the composite command which has been set up under the Navy Department by order of Defense Secretary Louis Johnson. Army vessels—227 in all—will be transferred to MSTS subsequently. Rear Admirals William M. Callaghan and A. J. Willings will assume their new duties as commander and vice commander, respectively, of the new service.

Scrap Men Await Decision

FOLLOWING hearings before railroad traffic executives in Chicago, New York, St. Louis, Atlanta and Buffalo, the scrap industry is awaiting a decision on its request for lower freight rates east of the Rocky mountains.

At the suggestion of railroad spokesmen, the Institute of Scrap Iron and Steel in presenting the case for the scrap industry modified its original position and is asking that freight rates on scrap be reduced to 135 per cent of the level of June 30, 1946. This is equivalent to a reduc-


Interlocking cranes move pipe over large dock area.
AMERICAN MONORAIL SAVES
Crane on swinging jibs loads parts from fabrication.
AMERICAN MONORAIL SAVES
To Reduce Cost of
SHIPPING and RECEIVING
Steel
Use AMERICAN MONORAIL
Overhead Handling Systems
Spur track from crane unloads coil to storage yard.
AMERICAN MONORAIL SAVES
Outside spur handles die blocks from truck to shop.
AMERICAN MONORAIL SAVES
Jib over gondola locks with track to steel warehouse.
AMERICAN MONORAIL SAVES

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE **CLEVELAND 7, OHIO**

tion of 18 or 19 per cent below the current level. The institute requested an early decision.

In appealing to the railroads, scrap spokesmen pointed out that existing high rates on scrap are diverting shipments from the railroads: Large tonnages are being moved by barge, particularly on the Mississippi and Ohio rivers. Foundries, it was said, are taking in more of their scrap by trucks. One midwestern steel company which ships its products largely by trucks to consumers located as far as 1000 miles from the mill has adopted the policy of bringing back return loads of scrap. Other steel companies contemplate taking similar action, the railroad men were told.

Low Bidder on Combination Ship

NEWPORT NEWS Ship Building and Dry Dock Co. was low bidder, in a Maritime Commission opening on Sept. 21, on a 22,000-ton passenger and cargo vessel to be operated by Mississippi Shipping Co. in the South American trade. The Newport bid was $12,690,000 for regular commercial construction and $13,960,000 for incorporating national defense features.

Johnson Clarifies Policy

DEFENSE SECRETARY Louis Johnson has clarified his Department's policy in replying to inquiries from manufacturers who wish to know if they may supply certain types of technical information to foreign business firms or to their agents in the U.S.

Under the new ruling, the Office of International Trade, Commerce Department, is recognized as the agency responsible for processing, reviewing, and replying to such requests. The Defense Department will continue to advise OIT on replies to requests involving military information of "potential strategic intelligence value" such as "information of important industrial processes and formulas, comprehensive lists of important industrial establishments, detailed information of transportation and communication systems," and even telephone or city directories.

Research Work Redirected

Under a new directive by the secretary of defense, all research and development work of the armed services hereafter will be under the direction and supervision of the Research and Development Board. Besides responsibility for formulating a completely integrated program of research and development for military purposes, the board now has the authority to determine if its program is being carried out by the three services and to direct changes in programs, including the initiation of new projects and the discontinuance of existing ones. Change results from recent amendments to the National Security Act.

Westover Returning to Business

BRIGADIER GENERAL Wendell Westover, Army Executive for Reserve and ROTC Affairs, has requested relief from active duty Nov. 15 to allow him to return to his heating and air conditioning business in Albany, N. Y., operating as Westover-Wolfe Co. Inc. General Westover is known in the metals industries as one of the pioneers in the introduction of stainless steel in the United States. That was in the period right after World War I when he had charge of stainless steel promotion for the former Ludlum Steel Co.

Possible Demand for Labor Law

ALTHOUGH the House Labor Committee has decided to take no further action for repeal of the Taft-Hartley Act—either this year or next — Chairman Lesinski (Dem., Mich.) admits that there may be some House demand for labor legislation if the need develops. In Congress and in the administration there is considerable concern about existing and threatened strikes: Potential moves are being studied and will come into the open if the situation worsens.

Post Office To Modernize

DEVELOPMENT of improved mechanical equipment and broader use of such equipment to speed up handling and delivery of mail is in the cards for the Post Office Department.

Congress has authorized a research and development program and appropriated $100,000 for that purpose. First move will be made after the department has completed its current reorganization. Plan is to appoint a research and development committee, to employ materials handling and other consultants and spend the $100,000 in setting up a plan which will be the basis of a more substantial appropriation request.

New Iron and Steel Magazine

GOVERNMENT iron and steel, slick paper magazine shortly will make its debut, probably in December. Long contemplated, it is to be set up as a quarterly issued by the Iron and Steel Division, Office of Domestic Commerce, Commerce Department. The subscription price, not yet determined, will be low. Editorial contents of the new publication will include: Statistics on world capacity and production; news of iron and steel industry expansion in the various countries; news of technological progress in the industry; information on raw materials, employment, demand trends, distribution and consumption. The plan is to run comprehensive feature articles on timely subjects.

Carson Appointed to FTC

JOHN CARSON, confirmed by a Senate vote of 45 to 25 as a member of the Federal Trade Commission, has a novel background for this office: He has served as a newspaper reporter and correspondent, as secretary to the late Sen. James Couzens of Michigan, as writer for the railroad brotherhood magazine known as *Labor* and, more recently, as director of the Washington office of the Cooperative League, U. S. A.

Republicans objected to his nomination on the ground that custom under the FTC statute called for appointment of a Republican. He is a political independent. They also found fault with his alleged "fuzzy" thinking about the capitalistic system in this country: In his examination by the Senate Banking committee he was bombarded with questions about what he meant in a speech in the depression period of the '30s. He had said it would be far better to adopt any one of many methods of repudiating the national debt "and keep our people free rather than to enslave them to insure payment of that debt." Sen. John W. Bricker (Rep., O.), who led the opposition, said Mr. Carson was "at best a dreamer" who "does not have any conception of the business system" and "does not agree with our system."

Regional Directors Appointed

REGIONAL DIRECTORS appointed by the reorganized Bureau of Mines are: Paul Zinner, at Minneapolis; Sinclair H. Lorain, at Juneau, Alaska; Stephen M. Shelton, at Albany, Ore.; Harold C. Miller, at San Francisco; John H. East Jr., at Denver; Dr. Clifford W. Seibel, at Amarillo, Tex.; and Harold P. Greenwald, at Pittsburgh. Under the new setup, these directors will be autonomous in their districts and will be able to make their own decisions without reference to the bureau's headquarters at Washington.

Western Europe Anticipates Inflation

Widescale currency devaluations could again upset prices which had settled to fairly stable levels. Britain, France, Belgium, Germany all fear dislocations

WESTERN EUROPE is trying to ward off another bout of inflation, anticipated as one result of currency devaluation.

British Labor is stepping up its campaign to hold the price line. France fears that the slight rise in the cost of living, accentuated by devaluation, will strengthen the Communist hand in the autumn wage drive. Belgium had more imports than exports in August for the first time in about three years. In a move to increase its self-sufficiency, Western Germany is intensifying its efforts to find new oil fields near the Dutch border.

Inflation Was Checked—In the second quarter of this year the inflation threat seemed "to have been definitely overcome," ECA comments. Wholesale prices in June, 1949, were the same or lower than those in December, 1948, in all countries except England and Austria where subsidy adjustments caused a rise of 5 and 25 per cent.

Industrial output of Western Europe in the second quarter reached a postwar peak 14 per cent above the corresponding period of 1948 and 17 per cent greater than prewar. Excluding Western Germany, which still is below the 1936-1938 level, output was 29 per cent above prewar. Steel production was up 25 per cent from the same 1938 period.

ECA believes that the harm done by devaluation to price stability will be more that offset by the increase in intra-European trade now that monetary systems are at more realistic levels. Total trade deficit of all ERP countries in the second quarter was $1.6 billion, compared with $1.4 billion in the first 1949 quarter and $1.2 billion in the fourth period of 1948.

SILENCED: Hitler's biggest long-range gun, used in 1943 during the siege of Sevastopol, Crimea, is being dismantled. Astride this once dangerous barrel is a German worker using a torch to cut the 100-foot long, 136-ton weapon into pieces 4 feet long for a dismantling firm in Bavaria. NEA photo

Labor Strife in France?

The old headache of wages and prices may reach migraine proportions for France this fall as the cost of living continues the slight upward climb begun in August after a stable period of about seven months.

Full effects of the drought are being felt now, just at the time when government is forced to devalue the franc about six per cent. The combined result is a rise in wholesale prices and renewed union wage demands, especially from the Communist controlled G. G. T. This group is demanding a return to the 40-hour week paid at the rate of 48 hours. Two other unions are asking an extra cost-of-living bonus.

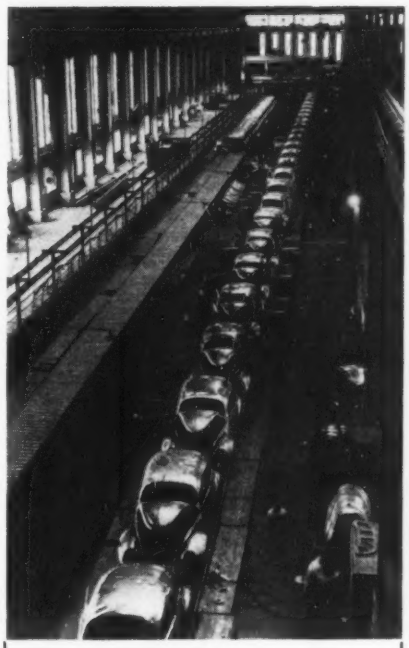
Tempering the price rise has been the remarkably successful tourist season in France.

French shipyards are now building ships at an annual delivery rate of 210,000 tons, but the industry fears that this fairly good pace can no longer be maintained now that Britain has devalued the sterling. Scotch shipyards have a tremendous competitive edge with the $2.80 pound; many private French firms may begin placing their shipbuilding orders in Glasgow.

Belgian Exports Slip

Belgians are alarmed at the decline in their exports which brought an unfavorable balance of trade in August for the first time in about three years.

Exports of machine tools, railroad equipment, castings and coal have fallen the most sharply, largely because of reviving competition from Western Germany. Steel shipments abroad have dropped slightly because Britain is cutting its imports of finished. Semifinished trade from Belgium to the United Kingdom continues at a brisk pace.



PRODUCTION LINE: Volkswagens that Hitler promised the German people are at last in quantity production. World War II interfered with production, and Germans had to postpone the day when each family would have one of the cars

In addition to export problems, the home market is sluggish. Construction industry, active because of government contracts to rebuild and repair roads, bridges and buildings, is the only one operating at full tilt. The metalworking industry is booking orders at a rate which if not improved will mean that it must operate at only about 30 per cent of capacity early next year. Unemployment is serious, and public works projects are being planned.

Germany Looks for Oil

Western Germany is trying to reduce its dependence upon imported oil and is looking for the fuel in its northwestern areas along the Dutch border.

Geologists and oil men are optimistic that the nation can become at least partly self-sufficient in the product. Oil has been found in several places, but quantities produced have thus far been small. During the war, test borings showed the existence of a large field called Emsland astride the German-Dutch frontier. Discovered in 1942, production the next

year was only 42,000 barrels of crude. About 800,000 barrels were produced in 1947, and 1.2 million last year. The Georgsdorf field, largest in the area, now produces about 70,000 barrels a month of high grade crude; this is being stepped up considerably. In 1948 German oil production was 4.4 million barrels.

ECA is releasing about $15 million in counterpart funds for use as long-term capital investments loans to coal mine operators in Bizonal Germany. ECA says that additional large capital expenditures will be required if the Bizone is to meet its coal production target of 450,000 tons daily. Since the start of the Marshall Plan, coal output in the area has already increased from 269,000 tons daily to the present rate of 336,000.

Austria Rebuilds

ECA has approved the release of $18.7 million from the Austrian counterpart fund for industrial and agricultural development.

Of this amount, $4,635,000 will be used for railroad reconstruction, $4,818,000 for industrial expansion, $3.5 million for hydroelectric power projects, $1,030,000 for coal mines, $772,000 for post and telegraph facilities, $1.7 million for highway construction and $2,250,000 for agricultural improvement.

Funds for industrial expansion include $2 million for the iron and steel industry, $1,540,000 for the paper and forestry industry, $843,000 for electrical equipment and metal processing industries and $435,000 for the textile industry.

Norwegian Output Up

Norwegian industrial production is at a rate 8 per cent higher than last year which was a record postwar period.

Reconstruction and modernization of the Nazi-destroyed iron ore works at Sor-Varanger near the Russian-Norwegian boundary will be completed by 1952. Half-capacity operations are expected by the end of 1950. Before production can begin, about 1 million tons of stone overlayer must be blasted and moved. Under normal operation the mines' yearly output of 2.3 million tons will necessitate the moving of over 1 million additional tons of stone each year. Though the open-pit mining and reduction system will be much the same as before the war, mechanization will speed output and pelleting will replace briquetting.

Norwegian salvage operators expect to obtain 2000 tons of scrap and armor plate by yearend in addition to valuable equipment from the half-sunk former German battleship *Tirpitz*. The vessel is in a fjord near Tromso. Inside is a wealth of motors, machines and parts which are believed to be only slightly damaged. Among the above-deck items recovered so far are five 450 and 750-hp diesel electric generators.

Reds Get U. S. Machinery

Department of Commerce has granted an export license to ship $503,000 worth of American blast hole drillers and accessories for oil fields in Russia. The drills are for shallow wells.

"Issuance of an export license for this equipment," says Commerce, "is consistent with the U. S. policy of trading with Eastern Europe in all kinds of commodities except those of significance to the security of the country."

Russell's Volume Gains

RECESSION over? It is for F. C. Russell Co., Cleveland, whose sales of metal windows, awnings, venetian blinds and related products have rebounded so strongly that this year's volume promises to approach that of the record 1948.

Here's how Russell has influenced its upturn: Greater use of mass production techniques although the construction industry generally is on a custom basis; production of a new ready-to-be-installed window just like a part for a motor; use of steel in output of windows now that the ferrous shortage is over.

Russell's sales volume increased nearly 100-fold from 1939 to 1948, from $154,128 in 1939 to $14,185,042 last year. From its founding in 1937 until 1945 its products were manufactured by subcontractors. Since 1945 the company has opened four plants in Cleveland, Columbiana, Pandora and Conneaut, O.

Continuing high sales are indicated by the success of Russell's newest product introduced July 1. It is a completely assembled packaged window with all the working parts of galvanized tubular steel. The unit comes to the contractor fitted with a wood surround designed to permit installation in any type of construction. No attachment of hardware, glazing or painting, except the wood surround, is required in the field. Price of the unit is competitive with conventional windows, and it has been so well received that Russell is seeking an additional 18,000 sq ft of manufacturing area.

Easier supplies of steel speeded introduction of the packaged window. Steel is better suited for repetitive processes required by mass production than wood, and steel is cheaper than most other metals.

Boom in LP Gas

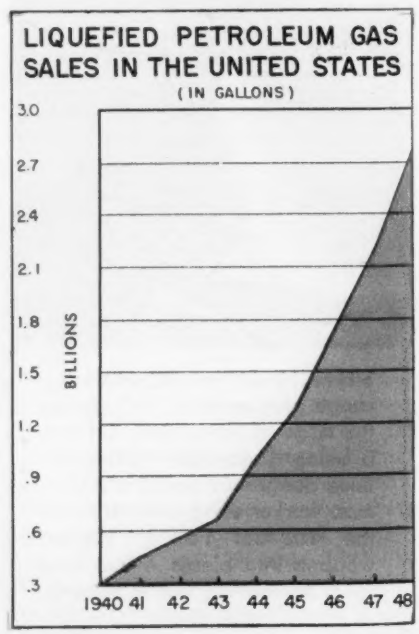
Metalworking industries reap benefits as oil conservation laws spur LPG output

METALWORKING industry's sales volume is benefiting from oil conservation legislation in petroleum-producing states. The chain reaction moves this way: State laws force oil men to use flare gases formerly burned as waste which are produced in conjunction with crude oil; vast development in methods to process flare gas into liquefied petroleum gases results; metalworking products are essential in production, marketing and use of LPG.

The war and promotional efforts of LPG marketing organizations have demonstrated the fuel may be used for home heating and cooking where natural gas is not available, for petrochemical products like synthetic rubber and plastic, for industry where natural gas is not available and as a stand-by fuel, for natural gas companies as a stand-by.

Nine Times Greater Than Prewar— Although LPG was first produced commercially in 1922, only 22,641 gallons were consumed. This had jumped to over 4.5 million gallons by 1928, to 141.4 million gallons by 1937. Today LPG sales are running more than 10,000 times what they were in 1922 and are nearly nine times what they were before the war (see accompanying chart).

Aside from using LPG both as a



Source: Bureau of Mines.

stand-by and for regular production, metalworking industry is benefiting from the youthful giant's growth in these ways: It supplies production machinery, transportation and container equipment and apparatus in which LPG is used like domestic and industrial furnaces, cooking stoves and burners.

Home Appliances — Metalworking finds its greatest boon from LPG in the increased market for gas cooking stoves and domestic furnaces. From 1935 to 1947, of the 7.2 million customers added to gas cooking, 3.2 million used LPG. Nearly 1.5 billion gallons or 53.8 per cent of total sales went to domestic users in 1948. Estimates are that 2.6 billion gallons will be consumed for domestic purposes by 1960.

Production Equipment—The peak in demand for equipment to process LPG may be yet to come because of this rising demand and because more state conservation legislation is possible.

Of the four largest oil-producing states—Texas, California, Louisiana and Oklahoma in that order—Texas and Oklahoma are enforcing their extensive laws strictly. If California and Louisiana clamp down on enforcement and also pass more severe legislation, demand for process machinery will rise. New oil fields are also opening in Texas and Oklahoma which sustain demand for the capital equipment.

Units used to produce LPG are similar to refinery equipment—compressors, absorption towers and heat exchangers. The oil well gas is pumped through pipelines to central stations where it is processed so that the liquid elements in the gas, in suspension like moisture in the air, are liquefied into propane and butane, more commonly called LPG.

Transportation Equipment—Transportation of the fuel is still one of the major problems facing both LPG and metalworking industries. To remain in its liquid state, LPG must be under slight pressure, so piping is impractical. Pressure tank cars available for LPG service now number only about 7000. More are on order and the use of tank trucks is also increasing.

"American Way" Contest

FREEDOMS FOUNDATION Inc., Valley Forge, Pa., will award prizes totaling $109,000 to American citizens who do the outstanding job each year of bringing about a better understanding of the American way of life. Entries postmarked before Oct. 1 are included in this year's judging.

Classifications in which awards will be made include: Editorials, sermons, company employee publications, union publications, magazine articles, radio programs, advertising campaigns and motion pictures. In addition, the Republican and Democratic members making the best address before the House of Representatives and Senate will receive $1000 awards with the prize to be given to charities designated by each of the four winners.

In Business 100 Years

COMMEMORATING its founding in 1849, Austin-Hastings Co. Inc., Cambridge, Mass., is sending copies of its book "A Century of Progress" to customers. In addition to a brief outline of company history the book describes present activities of divisions which distribute sheet metal, tubing, tool steel, metalworking equipment, including machine tools, and welding equipment.

Packaging Show Oct. 4

FOURTH annual industrial packaging and materials handling exposition will open its doors in Detroit's Convention Hall Oct. 4, for a three-day stint. There also will be a "materials handling and packaging institute" in the mornings at nearby Wayne University.

The exhibition, held last year in Chicago, is sponsored by the Society of Industrial Packaging and Materials Handling Engineers, 20 W. Jackson Blvd., Chicago. C. J. Carney Jr. is managing director.

Among the 80-odd exhibitors who have reserved space are many suppliers to the steel and metalworking industries, including: Acme Steel Co., Acorn Iron & Wire Works, Automatic Transportation Co., Brainard Steel Co., Dearborn Chemical Corp., International Staple & Machine Co., Markem Machine Co., Nox-Rust Chemical Corp., R.C.S. Tool Co., Signode Steel Strapping Co., Steel Parts Mfg. Co., the Stanley Works, Towmotor Corp., Gerrard Steel Strapping Division of United States Steel Corp., Yale & Towne Mfg. Co., Thomas A. Edison Inc., and Truck-Man Inc.

Meehanite Researchers To Meet

MANUFACTURERS of Meehanite castings in the United States and Canada will convene in the annual Meehanite research meeting, at Hotel Carter, Cleveland Nov. 2-5. Some two dozen researches conducted in the past year on all phases of foundry activity, including production, management and sales, will be presented to an expected attendance of more than 200.

CALENDAR OF MEETINGS

Oct. 3-4, National Association of Corrosion Engineers: South central regional meeting, Adolphus Hotel, Dallas. Heading the arrangement committee is G. R. Olson, United Gas Pipe Line Co., Shreveport, La.

Oct. 3-5, American Coke & Coal Chemicals Institute: Annual meeting, Skytop Lodge, Skytop, Pa. Institute headquarters are at 129 15th St. N.W., Washington.

Oct. 3-6, Association of Iron & Steel Engineers: Annual convention, William Penn Hotel, Pittsburgh. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 4-6, Society of Industrial Packaging & Materials Handling Engineers: Fourth annual exposition, Detroit.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Drake Hotel, Chicago.

Oct. 10-11, Boston Conference on Distribution: 21st annual affair, sponsored by Boston Chamber of Commerce, Harvard University, Boston University and others.

Oct. 10-13, Purchasing Agents Association of Baltimore: Annual manufacturers' products exhibits, Lord Baltimore Hotel, Baltimore. Chairman of the management committee is Stephen J. Buschman, Stark Electric Co., 1300 S. Short St., Baltimore.

Oct. 10-14, American Society for Testing Materials: First Pacific area national meeting, Fairmont Hotel, San Francisco. National headquarters are at 1916 Race St., Philadelphia.

Oct. 11-14, American Standards Association: 31st annual meeting, Waldorf-Astoria Hotel, New York. Association headquarters are at 70 E. 45th St., New York.

Oct. 12-15, Electrochemical Society: 96th convention, La Salle Hotel, Chicago. Details may be obtained from H. B. Linford, secretary, 235 W. 102nd St., New York.

Oct. 13, American Iron & Steel Institute: Regional technical meeting, Hotel Pick-Ohio, Youngstown.

Oct. 13-14, Steel Founders' Society of America: Fall meeting, Ambassador Hotel, Los Angeles. Society headquarters are in the Midland Bldg., Cleveland.

Oct. 13-14, Society for the Advancement of Management, Chicago Chapter: Fall training conference, at Illinois Institute of Technology. Conference chairman is H. A. Mercer, Sterling Tool Products Co., 2085 N. Hawthorne Ave., Melrose Park, Ill. Fee is $15 for society members and $30 for nonmembers.

Oct. 13-15, Industrial Management Conference of the University of Missouri: Third annual meeting, University of Missouri, Columbia, Mo.

Oct. 13-15, Foundry Equipment Manufacturers Association: Annual meeting Greenbrier Hotel, White Sulphur Springs, W. Va. Association headquarters are in the Engineers Bldg., Cleveland.

Oct. 14-15, American Institute of Mining & Metallurgical Engineers: Annual fall meeting, Southern Ohio Section of Open Hearth Committee, Deshler-Wallick Hotel, Columbus, O. Institute headquarters are at 29 W. 39th St., New York.

Oct. 14-16, Metal Treating Institute: Annual meeting, Cleveland. Institute headquarters are at 420 Lexington Ave., New York.

Oct. 16-18, Conveyor Equipment Manufacturers Association: Annual meeting; write to G. D. O'Brien, assistant manager, Greenbrier Hotel, White Sulphur Springs, W. Va.

Oct. 17-21, 31st Annual National Metal Congress and Exposition: Sponsoring societies are: **American Society for Metals, American Welding Society, Metals Branch of the American Institute of Mining and Metallurgical Engineers and Society for Non-Destructive Testing.** Public Auditorium, Cleveland. Secretary of American Society for Metals is W. H. Eisenman whose headquarters are at 7301 Euclid Ave., Cleveland 3.

the trend is to N-A-X HIGH-TENSILE STEEL for

BUMPERS • GRILLES • HOODS
FENDERS • BODY PANELS • DECK LIDS
FRAMES • BRACINGS • WHEELS • HUB CAPS
AND OTHER AUTOMOTIVE PARTS

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N-A-X HIGH-TENSILE MEETS ALL REQUIREMENTS OF S.A.E. 950

Specify N-A-X HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
Unit of National Steel Corporation

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Restraint in use of chromium-plated steel and die castings is likely to be evident in changeovers made later this year. It would mean a saving in cost, though only trifling

DETROIT

RESTRAINT in the use of chromium-plated steel and die castings, already evident on three 1950 models—Buick, Nash and Studebaker—is likely to be evident on other makes as changeovers are made later this year. The feeling is prevalent in many sections of the industry that the trend toward flamboyancy of chromium has been overdone, that it should be confined to places where a definite utility value can be established—not just splashed all over exteriors and interiors for no better reason than the supposition that "the public wants chromium." And, of course, elimination of chromium plate means a saving in cost, trifling though it may be.

An example of the so-called indiscriminate use of chromium plate might be the "sweep spear" side molding which Buick has fitted on its convertible and Riviera models. Undoubtedly many buyers like it, but competent designers shudder when they see it. On the other hand, the body side molding strips on many cars (about half way between the rocker panel and belt line, or at the widest part of the bulge in the bulge of the body) have a definite utilitarian value: They protect the painted body panels from the impact of opening doors on adjacent vehicle, particularly in parking lots. Chromium molding strips also serve to conceal unsightly seams where painted body elements are joined.

Small Saving—O. J. Crowe of Herron-Zimmers Molding Co. is quoted as saying that if moldings which are used for decorative purpose only were switched from plated to painted types, the selling price of the car would not be reduced by much more than 1 per cent. He believes too that the elimination of chrome decorative strips would not boost sales in the least since there is "a little Indian in all of us" and the car with eye appeal outsells its competitor even though it may cost a little more.

Some applications of chromium plate on interior spots like instrument panels, steering wheel hubs, horn rings, garnish moldings, buttons, handles and knobs seem little short of ridiculous—from an appearance standpoint and because of the annoyance and hazards involved in reflection of bright sunlight into the eyes of drivers and passengers. Now that window areas are being further increased, the problem of bright metal appurtenances becomes critical.

Even highly polished painted surfaces are guilty on this score, and something needs to be done to correct the deficiency at once. Such expedients as placing rubber mats on the instrument panel "shelf" directly behind the windshield to cut off annoying sun reflections are a sad commentary on the proficiency of designers who, you might imagine, would never let a simple thing like this get by into production.

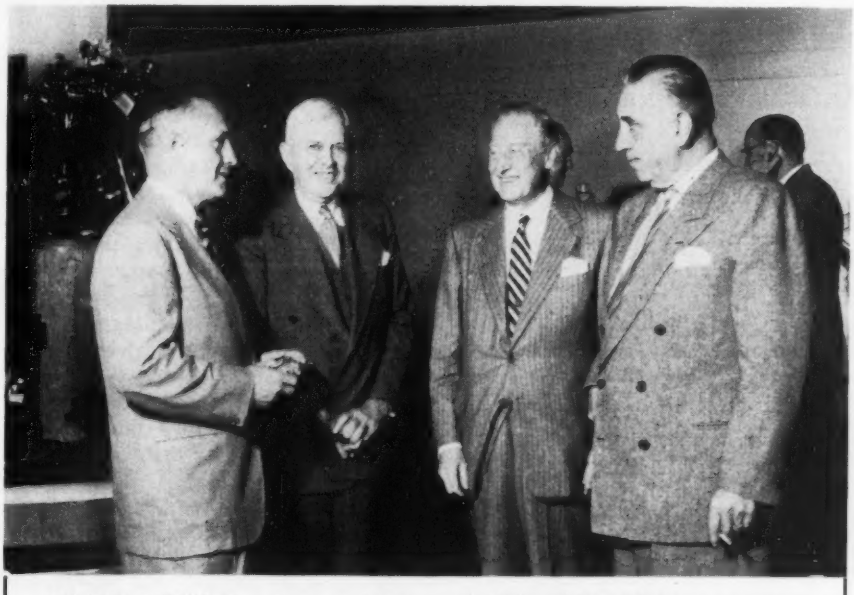
Camouflages Waviness—One engineer suggests a reason for the rash of chromium decorative molding strips on body exteriors of postwar models. He says it is to take the eye of the owner off waviness and rippling in the steel stampings making up hoods, roofs, door panels and other large areas. Even the best cold-rolling practice apparently cannot consistently produce wide sheet stock free from this occasional waviness which is not removed by stretcher leveling or press operations. You might not notice this but since fenders have been blended into the sides of bodies, resulting in a much greater expanse of flat surface unbroken by any sharp curves, minor surface deviations are accentuated.

The same authority wonders if improved quality might not result from abrasive belt polishing of cold-rolled steel after the final skin pass. He thinks that by taking off about 0.005-inch from the surface, the microscopic "crud" or "bark" would be whisked off, leaving a better surface for painting.

Some unusual things are being accomplished by belt polishing of steel in the flat for parts which are subsequently formed and plated. Pontiac and Briggs have made notable strides in this work and Oldsmobile has a big equipment installation under way.

Olds Dealers Hire More Salesmen

SHOWING HOW Oldsmobile sizes up the sales picture, the division's 3700



OUTPUT DOUBLED: First anniversary of Oldsmobile's high compression V-8 "Rocket" engine was celebrated at Lansing, Mich., with the announcement that hourly output of power plant had been doubled. At the press reception were: Host S. E. Skinner, vice president of General Motors Corp. and general manager of Oldsmobile Division; C. E. Wilson, president of GM; H. H. Curtice, executive vice president of GM; and G. R. Jones, Oldsmobile's general sales manager. The 135-horsepower, 8-cylinder engine is seen in the background as part of an exhibit

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dealers in the past six weeks have hired 3300 more salesmen, bringing the total force at present to 8500. By yearend the figure is expected to climb to 10,000 or twice the number of sales personnel at work early this year. A six-month coast-to-coast training program is now in its second month, under factory supervision, and district managers are holding 584 meetings a month to school both new and experienced salesmen.

With the first anniversary of the introduction of its V-8 rocket engine properly commemorated, Oldsmobile is moving ahead briskly with expansion of final assembly facilities. Steelwork is up and masonry now is being laid. The new assembly plant replaces one in operation since 1911. A notable improvement, other than the building itself, will be in material handling equipment of all types. A conveyor system will bring subassemblies and component parts from fabricating plants thousands of feet away to the point where they are used along the final assembly line. Even employees will pass from one part of the plant to another on special ramps which will connect second floor levels of the two buildings, formerly used as warehouses for new car and parts storage. Two large conveyor ramps are being built to bring bodies, pressed steel parts, rear axles and front wheel units into the assembly area. A large frame handling system is being erected to allow easy unloading of frames from railroad cars.

No Signal for Price Cuts

REDUCTION of 1950 model Nash prices by $73-$140 made possible by lower material prices and the termination of steel ingot conversion deals cannot be regarded as the signal for the start of the industry-wide reductions. It may bring a little pressure on Packard, Hudson and Studebaker, but the Big Three are regarded as settled in a steady price position; further reductions are likely to come from dealers in the form of better trade-in allowances—unless the bottom really falls out of the market in 1950. No one in Detroit has any serious expectation of such a turn.

Production Milestones Whiz By

MILESTONES of production continue to rush by. Early last week the 5 millionth motor vehicle to be built in the U. S. and Canada this year became a reality. A day later the figure for complete output of U. S. plants in 1948 was passed. The three Ford brothers recently hopped into a new convertible as it rolled from the line and, with cameras clicking, ushered the 1 millionth Ford of the present series into being. Assemblies of the current model began in June, 1948. The whispered suggestion that Ford was overdue for some kind of a model change was lost in the tumult. Meanwhile Buick broke out the colors for its 300,000th car built this year and the 1 millionth postwar completion. It surged Buick's all-time production up to 5,381,433. The first million took 19 years, the postwar million just four years.

The domestic market absorbed 96.6 per cent of August's all time high U. S. production of motor vehicles. Exports of 22,625 passenger cars, trucks and busses percentagewise set a new postwar low for a given month. For eight months of the year, shipments abroad accounted for about 5 per cent of all factory sales and at 208,215 were 30 per cent off from a year ago.

Not According to Pattern—September auto output was all the more surprising because of the industry's normal sales pattern. For the period 1935—1939, new car sales in September dropped an average of 26.5 per cent below August, in October increased 9.6 per cent over September, in November rose 32.7 per cent over October, and in December increased 1 per cent over November.

Sales and production, of course, are two different things, although they usually are geared pretty closely, with 10-day sales reports being watched carefully by all manufacturers as a guide to production planning. If this was the policy last month, then certainly there was no 26.5 per cent drop from the August level. Either that is true, or dealers are really becoming loaded with new cars.

Trade-in Premiums—Reports are more frequent of dealers offering long prices on trade-ins, particularly where the sale of a high-priced model is involved. Most retailers, though, are cautious about building up used-car stocks. If the trade-ins do not move fast, then they are wholesaled, even if at a loss.

In the 1935—1939 pattern, auto sales hit two peaks, spring and fall, ever since the introduction of fall models in 1935. In these prewar years, sales by quarters averaged: First quarter 22.9 per cent, second quarter 31.1 per cent, third quarter 22.7 per cent and fourth quarter 23.3 per cent.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	604,351	489,736
August	675,000*	478,186
September	647,000*	437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

* Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
Sept. 10	123,806	78,677
Sept. 17	159,493	94,410
Sept. 24	155,134	98,394
Oct. 3	150,000	121,475

Estimates by Ward's Automotive Reports

September Car Output High

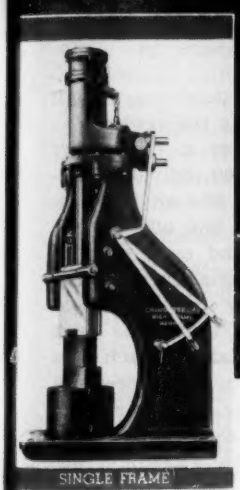
PRODUCTION of cars and trucks for September held strong right down to month's end. The final tabulation for U. S. and Canada should come close to 650,000, a little short of August but still a remarkable record, when you consider that working time for the month was less than in August. Signs point to an easing of the pace. Mercury has trimmed 120 units from its daily schedules which have been running a little better than 1000. Willys-Overland assembly lines and some other departments have been closed down since Sept. 23 for inventory adjustment. Resumption is scheduled this week.

Kaiser-Frazer production is slated for suspension this week for the same official reason. Incidentally, output of Frazer models at Willow Run has dwindled to the vanishing point, and presumably will not figure in further scheduling.

Export Market Not a Good Bet

EXPORT MARKET looks like a poor bet to make any early recovery. Yet, B. C. Budd, general manager of Packard's export division, took an optimistic view of the future as he sailed for Europe the other day to contact distributors in England, Holland, Belgium, Switzerland, and other continental and Mediterranean areas. He observed that the world financial situation and the extreme shortage of American dollars have had a temporary serious effect on the export business, although he was hopeful that the new problems arising might be solved eventually.

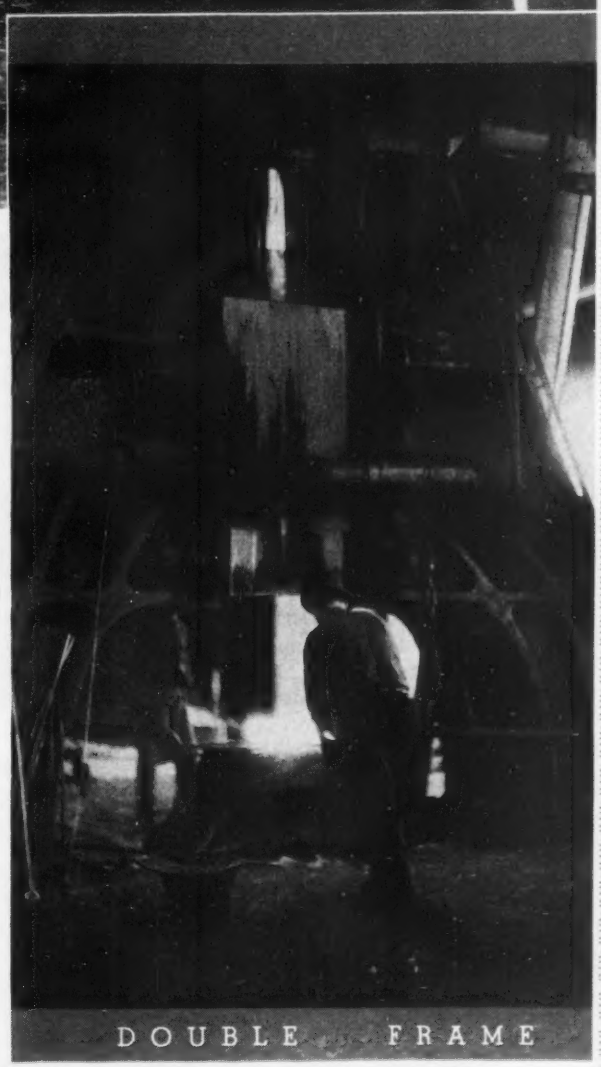
CHAMBERSBURG



SINGLE FRAME

MODEL "L" FLAT DIE FORGING HAMMERS

Greater economy from new automatically lubricated small-bore cylinder and differential valving; more production on heavier anvil. Have you checked on these Model "L" hammers?



DOUBLE FRAME

CHAMBERSBURG ENGINEERING CO. CHAMBERSBURG CHAMBERSBURG, PA.

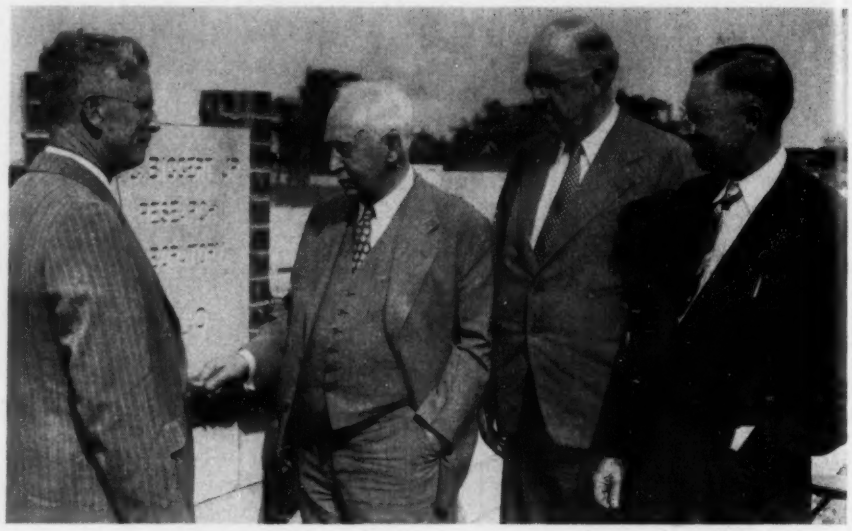
Building New Lab

Structure will further United Engineering & Foundry research in iron castings and rolls

TO FURTHER its research in iron castings and rolls for the steel, nonferrous, rubber, plastics and paper industries, United Engineering & Foundry Co. is building a $125,000 research laboratory at its Canton, O., plant.

The structure, 42 by 110 feet, will contain all necessary research facilities such as melting and heat treating furnaces, physical testing equipment and a modern spectroscopic laboratory. Space is also provided in the new building for the present chemical laboratory. Also included will be a library for all technical and trade journals and books pertaining to cast iron and foundry practice.

The new building, expected to be in full operation about Nov. 1, is being named the F. C. Biggert Jr. Research Laboratory in honor of the chairman of the company's directors and former president of the concern.



LAY CORNERSTONE: Attending cornerstone laying ceremonies at United Engineering & Foundry Co.'s new research laboratory at Canton, O., are these company representatives: Left to right, John Quinn, director and former manager of the company's Canton plant; F. C. Biggert Jr., board chairman; K. C. Gardner, president; and K. F. Schmidt, Canton plant superintendent

Chain by the Carton

PACKAGED chain in telescopic-lid fiber board containers is offered by Campbell Chain Co., York, Pa. Each container holds about 100 pounds of chain with two color labels on top and side designating the exact length and size. Type of chain and its working load is also printed on two labels for quick identification and greater safety in use. Each chain end is tagged so that it is easily found in the container.

Same type of container will be used for larger shipments. Tests show the large and small containers easier and safer to handle and store than wooden barrels formerly used.

Rigidized Tubing Available

STANDARD TUBE Co., Detroit, has an exclusive arrangement with Rigidized Metals Corp., Buffalo, for manufacture of "Rigidized" carbon steel tubing. The process rolls textured patterns in flat material and redistributes metal through its cross section. In addition to producing attractive textured patterns it increases stiffness, strength and impact value.

Patterns are rolled into the strip which is subsequently formed and resistance welded into tubing. Because patterns are rolled on both sides of the strip with a male and female roll, 16 gage is the heaviest that can be rolled.

Rigidized carbon steel tubing is proving popular with manufacturers of chrome plated tubular products. Polishing is not necessary after plating because surface defects such as scratches are hidden by reflection of light from the patterned material. Some platers have eliminated copper plating before nickel and chrome entirely. Lower plating costs in some cases more than offset the added cost of rigidizing.

Foundry Expansion Planned

BUDD Co., Philadelphia, announces plans for the erection of a $1.5 million dollar foundry in northeast Philadelphia with construction to start this month. Plant will furnish gray iron castings for other company divisions and automotive customers with eastern assembly plants.

Structure will be one story high and cover more than 43,000 sq ft. Between 400 and 500 workers will man the plant after it goes into production. Dust arresters and smoke consumers will be installed in the plant to provide ideal working conditions.

Research Center Ready

FUNDAMENTAL research operations in organic chemicals and resins for Carbide & Carbon Chemicals Corp., Union Carbide & Carbon Corp. subsidiary, will be conducted at the firm's new industrial research center in South Charleston, W. Va. Program will concentrate on design of new chemical molecules with the goal of developing "Flexol" plasticizers, synthetic resins and organic chemicals. Process development will also be carried on at the center.

Main laboratory is a three-story building containing 69 individual laboratories, 48 offices and an auditorium. All laboratory and office space is air conditioned and each room is provided with individual thermostatic control. Possibility of cross-contamination between areas has been eliminated by maintaining each laboratory at a slight negative pressure with regard to offices and corridors.

Physical testing equipment at the center includes: An electronic microscope, a mass spectrometer, a vacuum coating unit for electronmicrographs, an x-ray diffraction unit, a microdensitometer and ultraviolet and infrared spectrometers.

Plant Offered for $1

OFFER to sell its Auburn, N. Y., plant to the city for $1 is made by International Harvester Co., Chicago. Company's board of directors authorizes the transfer of land, buildings and building equipment to any public body, provided it represents the community.

Ralph C. Archer, International Harvester vice president, says the company desires to make the plant available so that some other factory will be attracted to Auburn and provide employment when Harvester closes. The offer will stand until it can be decided whether the transfer can be effected in the best interest of the community.

International Harvester will begin to close the plant in March and finish moving out its machine tools by November, 1950.

Briefs . . . .

Paragraphs on developments of interest and significance within the metalworking industry

Blaw-Knox Co.'s Chemical Plants Division, Pittsburgh, is working on construction of a materials testing reactor near Arco, Idaho, for the Atomic Energy Commission. The company will supply architect-engineer services for the project which will cost an estimated $20 million.

—o—

American Blower Corp., Detroit, American Radiator & Standard Sanitary Corp. subsidiary, plans to build a manufacturing and assembly plant at San Leandro, Calif. First unit, to provide 40,000 sq ft of manufacturing space, is scheduled for completion in January, 1950.

—o—

American Home Laundry Manufacturers' Association reports factory sales of standard size household washers in July at 200,900, down 26.2 per cent from the year's high of 272,000 units in June. Ironers sold in July were 17,700, a decrease of 14 per cent from June's 20,600 units.

—o—

C. J. Tagliabue Corp., Newark, N. J., has published a 16-page catalog, "TAG Laboratory Thermometers and Hydrometers," available without charge.

—o—

Anderson-Miller & Poston Mfg. Co., Spokane, Wash., manufacturer of aluminum couplers, valves, tees, risers, elbows and adapters for irrigation equipment and industrial use appointed Dreifus Steel Corp., Philadelphia, exclusive export representative for trading in all foreign countries except Canada.

—o—

Nicholson & Hall Boiler & Welding Corp. is occupying a new plant and offices at 41 Columbia St., Buffalo.

—o—

Circulair Metal & Equipment Co., Louisville, is changing its name to Lewis Metal Equipment Co. Inc. Management, services and policy remain unchanged.

—o—

Preco Inc., Los Angeles, is moving its offices and factory to 6300 E. Slauson Ave. The company manufactures railroad refrigerator car special equipment, farm implements and road machinery.

—o—

Kieley & Mueller Inc., North Bergen, N. J., announces appointment of three sales representatives to handle distribution of its industrial control valve line on the West Coast. W. J. Beckett Co., Los Angeles, will cover southern California and Arizona. Northern California and part of Nevada will be handled by Hugh Rodman. Farnes & Martig Inc., Portland, Oreg., has as its territory Oregon and Washington.

—o—

Pittsburgh Mill Steel Co. Inc., New York, announces formation of a Coal Division to handle exclusive sales franchises from coal producers in the Pittsburgh and West Virginia area. Paul V. Forte will serve as a consultant in coal purchasing.

—o—

New Departure Division, Bristol, Conn., General Motors Corp., is moving district offices to following new locations: 937-A Park Square Bldg., Boston; 1357 W. 18th St., Indianapolis; 1716 Fourth St., Berkeley, Calif. (formerly San Francisco).

—o—

Enameled Metals Co., Pittsburgh, has named Allied Industries, Los Angeles, as sales representative in southern California, Arizona, and southern Nevada for conduit, electrical metallic tubing and fittings.

—o—

Graver Water Conditioning Co., division of Graver Tank & Mfg. Co. Inc., now occupies larger quarters at 216 W. 14th St., New York 11. The new location houses expanded sales and engineering offices, a chemical laboratory and a pilot plant for work in water treatment and liquid conditioning processes.

—o—

Westinghouse Electric Corp. will build a 1250 hp direct current motor, one of the largest ever designed for a paper forming machine, for Enso-Gutzeit paper mill in Finland. A 1000 kw synchronous motor-generator set for supplying power, control and regulating equipment and other auxiliary equipment are included in the order which will be filled at the firm's East Pittsburgh, Pa., plant.

—o—

Vacuum Cleaner Manufacturers' Association, Cleveland, announces sales of standard-size vacuum cleaners passed the 2 million mark late last month. Manufacturers predict sales for the year will reach 2.7 million units, below 1947 and 1948 totals but more than 60 per cent above the 1941 total, the best prewar year.

—o—

Allied Wire Products Co. equipped several thousand square feet of space in a building to the rear of its facility in Reiserstown, Md., to produce items of wire made to customers' demands. John M. Bucheimer is president.

—o—

Power Chemicals Division of E. F. Drew & Co. Inc., New York, will again conduct a series of lectures on industrial water treatment and related problems. The four-lecture and discussion series will be held in the Middle West and in Philadelphia for the first time this year. Dr. R. C. Ulmer, Drew technical director, will conduct the program.

—o—

Bethlehem Steel Co.'s Shipbuilding Division, Baltimore, will shortly begin reconstruction and widening of its graving dock. When completed it will handle vessels up to 575 feet in length and 74 feet in beam.

—o—

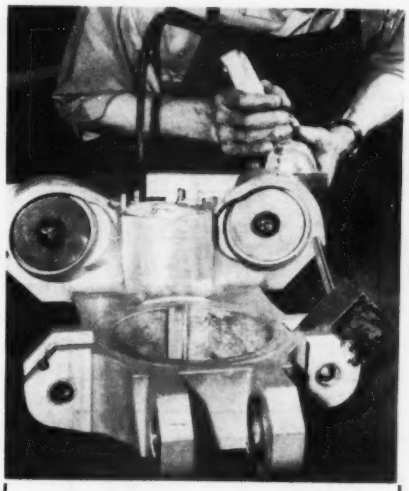
Zippo Mfg. Co., Bradford, Pa., will open a plant at 2152 Allen Ave., Niagara Falls, Ont., to make lighters.

—o—

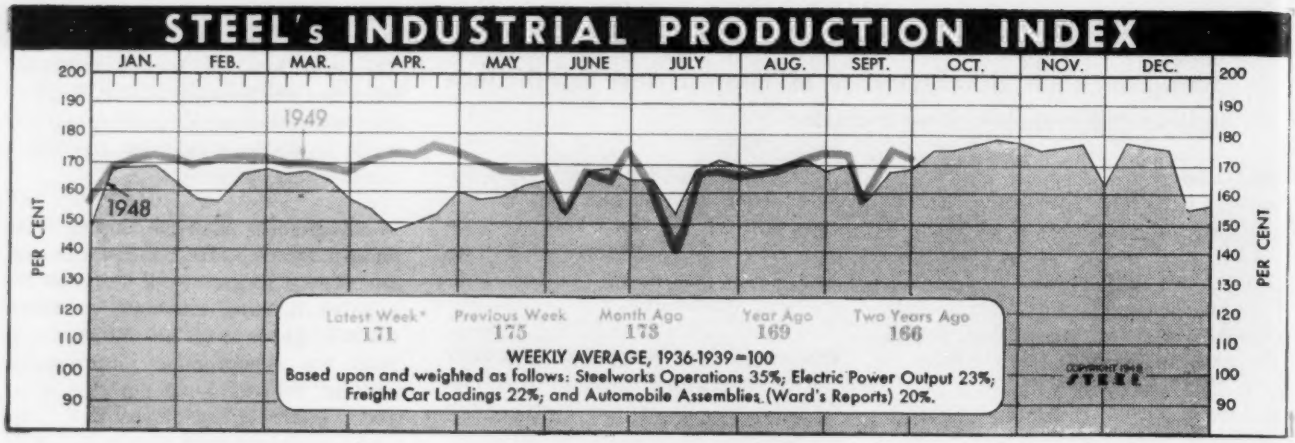
Hills-McCanna Co., Chicago, has appointed Cole-Schreiber, Encino, Calif., as its representative for aircraft quality magnesium alloy sand castings and racing car parts.

—o—

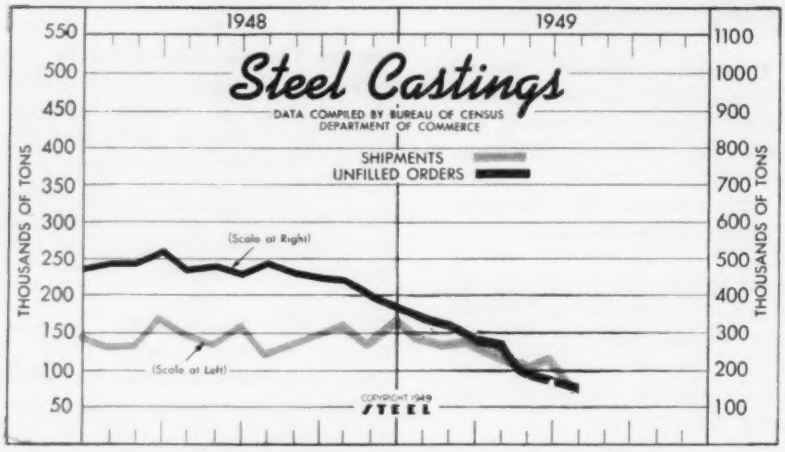
Midwestern Technical Institute, Park Ridge, Ill., is holding a design exhibit of work from the departments of industrial design and architecture at the Pickwick Theatre in Park Ridge.



TIME SAVER: An electric drill is used by Texas Engineering & Mfg. Co. Inc., Dallas, to drill "half-holes," formerly rasped out with a file. The new method cuts time requirement 50 per cent and gives cleaner and more uniform work than the old way. The procedure change is made possible by a special "half-hole" drill jig which eliminates hand work


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
PER CENT
1949
1948
Latest Week* 171
Previous Week 175
Month Ago 173
Year Ago 169
Two Years Ago 166
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1948 STEEL

* Week ended Sept. 24 (preliminary).

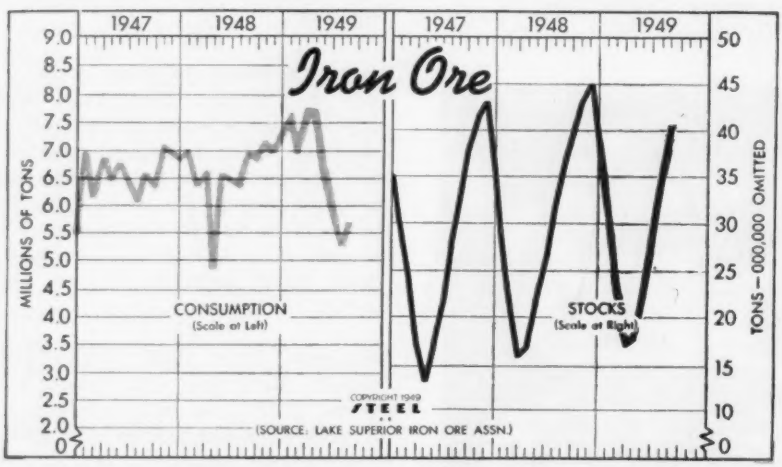


Steel Castings

(Net tons in thousands)

	Shipments			Unfilled Orders*		
	1949	1948	1947	1949	1948	1947
Jan.	140.6	141.1	139.0	338.9	491.7	365.5
Feb.	135.0	142.4	125.6	320.2	497.1	421.4
Mar.	138.9	162.9	134.9	284.8	508.8	434.9
Apr.	120.0	150.3	144.2	250.5	472.4	427.6
May	106.2	143.3	140.9	191.5	482.5	443.2
June	116.1	152.9	139.0	173.2	470.0	445.5
July	78.7	120.4	117.0	155.5	497.4	473.9
Aug.	....	140.2	120.4	....	472.5	478.6
Sept.	....	149.2	137.4	....	448.0	526.2
Oct.	....	153.0	148.4	....	421.5	497.3
Nov.	....	146.8	130.1	....	395.0	493.3
Dec.	....	157.4	148.1	....	354.5	489.4

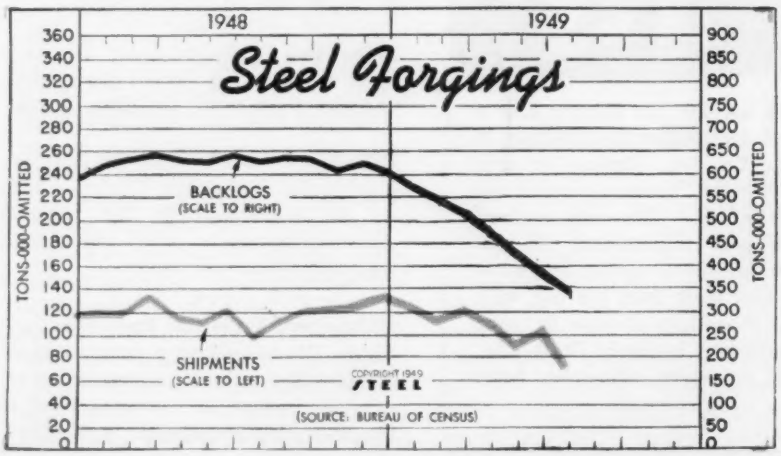
* Castings for sale.



Iron Ore

(Lake Superior Iron Ore Assn.)
Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and Furnaces	
	1949	1948	1949	1948
Jan.	7,590	7,057	31,904	29,081
Feb.	6,992	6,440	24,981	22,628
Mar.	7,735	6,634	17,308	16,022
Apr.	7,322	4,976	17,803	17,125
May	7,277	6,656	21,508	22,058
June	6,249	6,577	27,696	26,965
July	5,258	6,479	35,064	32,611
Aug.	5,711	7,036	40,811	37,081
Sept.	....	6,965	.....	40,923
Oct.	....	7,273	.....	43,883
Nov.	....	7,058	.....	45,160
Dec.	....	7,351	.....	39,460
Total	....	80,504		



Steel Forgings

(Tons—000 omitted)

	Shipments*		Unfilled Orders*	
	1949	1948	1949	1948
January	125	118	571	618
February	111	117	540	631
March	120	131	504	641
April	104	114	465	628
May	92	109	412	624
June	101	119	377	639
July	70	97	348	625
August	...	111	...	634
September	...	121	...	631
October	...	123	...	605
November	...	124	...	621
December	...	132	...	601

* Forgings for sale.

The Business Trend

ALTHOUGH it failed to match the year's high of 175 recorded in the revised total for preceding week, STEEL's industrial production index for the week ended Sept. 24 remained high at 171 per cent of the 1936-1939 average. The decline from the total for the preceding week was traceable almost entirely to the miners' walkout.

AUTOMOBILES—Industry predictions are the fourth quarter will see a slowing down of the assembly pace but current production remains high. Outturn in the week ended Sept. 24 dipped to 155,134 passenger cars and trucks from 159,493 in the preceding week but easily topped the 98,394 assemblies for the corresponding week last year. Early last week two milestones were passed when the 5 millionth motor vehicle for 1949 came off a U. S. or Canadian assembly line and production topped that for all of 1948. Industry executives see full scale competition rushing up, however, and are speeding research and development programs in order to have their best competitive foot forward.

STEEL—Steelmaking rate declined fractionally in the week ended Sept. 24 to 86 per cent of capacity from 86.5 in the preceding week. It is not possible to attach any significance to such a small change in the ingot rate, especially since the off again-on again steel strike has greater effect on any week's operating schedule than other economic factors.

COAL—Situation in the coal industry also has some bearing on steel production as a few producers report they are banking furnaces to conserve coal supplies. Output which was only 8.4 million net tons in the week ended Sept. 17, before the latest walkout began, will fall away to a dribble until the mine operators and United Mine Workers settle their differences.

RAILROADS—Association of American Railroads reports Class 1 railroads installed 1296 new locomotives in the first eight months of 1949. These included 1249 diesel and 47 steam. New locomotives installed in the same 1948 period included 802 diesel, 41 steam and 4 electric. On order on Sept. 1 were 869 diesel, 23 steam and 4 electric locomotives.

BUSINESS—Commercial and industrial failures numbered 810 in August, 13 per cent above July. Dun & Bradstreet tabulation shows latest total to be 85 per cent higher than in August, 1948, and higher than in any August since 1941. Liabilities were the largest since April, totaling $31.2 million.

PRICES—Wholesale price index of the Bureau of Labor Statistics declined to 154.1 per cent of the 1926 average in the week ended Sept. 20 from 154.6 in the preceding week. In the corresponding week of 1948 the index was 9.1 per cent higher.

CONSTRUCTION—Civil engineering construction volume totaled $188.7 million in the week ended Sept. 22, 21 per cent above the volume for the preceding week and 88 per cent above the volume for the like week in 1948. Heavy construction for the year to date totals more than $6 billion and is 20 per cent higher than for the corresponding period last year.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	86.0	86.5	84.5	96.0
	Electric Power Distributed (million kilowatt hours)	5,550‡	5,579	5,523	5,461
	Bituminous Coal Production (daily av.—1000 tons)	1,400	971	1,258	2,034
	Petroleum Production (daily av.—1000 bbl)	4,800‡	4,845	4,717	5,343
	Construction Volume (ENR—Unit $1,000,000)	$188.7	$156.0	$147.7	$100.3
	Automobile and Truck Output (Ward's—number units)	155,134	159,493	155,367	98,394
	*Dates on request. †1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons. ‡Preliminary.				
TRADE	Freight Car Loadings (Unit—1000 cars)	620†	743	749	908
	Business Failures (Dun & Bradstreet, number)	180‡	185	176	101
	Money in Circulation (in millions of dollars)‡	$27,365	$27,454	$27,328	$28,083
	Department Store Sales (changes from like wk. a yr. ago)‡	−7%	−4%	−7%	+12%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,145	$12,830	$12,341	$16,185
	Federal Gross Debt (billions)	$256.4	$256.5	$255.3	$252.2
	Bond Volume, NYSE (millions)	$14.2	$14.3	$11.4	$13.6
	Stocks Sales, NYSE (thousands of shares)	6,366	6,812	3,662	4,132
	Loans and Investments (billions)†	$66.3	$65.7	$64.7	$63.7
	United States Gov't. Obligations Held (millions)†	$37,594	$37,378	$36,485	$34,744
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Average††	152.52	152.52	152.52	151.86
	STEEL's Nonferrous Metal Composite‡	180.3	180.3	180.3	220.7
	All Commodities†	154.3	154.6	151.9	169.5
	Metals and Metal Products†	169.3	168.9	167.9	172.0
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				

Men of Industry

WILLIAM J. SPARLING

William J. Sparling has been elected vice president and manager, Chain & Transmission Division, **Chain Belt Co.,** Milwaukee. He joined the company in 1928 as a student engineer, and since 1945 has been works manager of the Chain & Transmission Division. **E. P. Meyer** succeeds Mr. Sparling in that position. **Roscoe O. Byers** has been appointed factory manager of the division.

—o—

Stanley E. Cobbledick has been appointed sales manager, Franklin Steel Division, **Borg-Warner Corp.,** Chicago. **Samuel W. Cherry** was appointed superintendent of the Franklin plant, Franklin, Pa. Mr. Cobbledick for many years has been identified with the rail steel industry, and Mr. Cherry had previously been connected with American Steel & Wire Co., Kaiser Steel Corp. and Northern Steel Co.

—o—

Shelby E. Race has been elected president and general manager of **Lansing Co.,** Lansing, Mich. He has been treasurer and sales manager, and is succeeded as treasurer by **Otis P. Dean.**

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Roger H. Dowling has been appointed general service manager of **York Corp.,** York, Pa., a newly created position. He formerly was assistant sales manager in charge of all engineering and pricing phases of sales department operations.

—o—

T. James Reed has been appointed plant manager, and **M. J. McNicholas,** purchasing agent of **North American Philips Co. Inc.,** New York. Both appointments are at the firm's Dobbs Ferry, N. Y., plant.

ARTHUR M. KRIEGER

Arthur M. Krieger has been appointed president and general manager of **Chemsteel Construction Co. Inc.,** Pittsburgh. Mr. Krieger, recently resigned manager of the Estate Heatrola Division of Noma Electric Corp., Hamilton, O., was employed 25 years by Universal Atlas Cement and Carnegie-Illinois Steel, subsidiaries of U. S. Steel Corp., in construction, maintenance and operating divisions. Other elections at Chemsteel Construction Co. include **Clarence B. Avery,** vice president-engineering, **Merrill A. Stewart,** vice president-construction, and **Charles E. Stone,** secretary and treasurer.

—o—

S. J. Woodworth has been appointed sales manager, Wright Hoist Division, **American Chain & Cable Co. Inc.,** at Bridgeport, Conn. He will have headquarters in York, Pa. Mr. Woodworth succeeds **A. R. Haskins** who is resigning Oct. 15 to establish a business in Milwaukee after 25 years of association with the division.

—o—

David I. McCready, formerly with Somers, Fitler & Todd Co., Pittsburgh, has joined the sales staff of **Graton & Knight Co.,** Worcester, Mass. He will cover western Pennsylvania, West Virginia and Virginia, maintaining headquarters in Pittsburgh.

—o—

Harry E. Lewis has been assigned to the foreign and export department, **Worthington Pump & Machinery Corp.,** Harrison, N. J. He was formerly works comptroller of the Holyoke, Mass., works. **George Bourque** has been appointed works comptroller to succeed Mr. Lewis.

NORMAN A. MALONE

Norman A. Malone has been elected vice president and general manager of the Canton, O., plant of **Barium Steel Corp.** An industrial engineer and steel production man of 20 years' experience with Otis Steel Co., Republic Steel Corp., and the Steel & Tube Division of Timken Roller Bearing Co., Mr. Malone joined Barium Steel Corp. a few years ago as general manager of Sheffield Iron & Steel Co., subsidiary company, where he served as general manager.

—o—

R. A. Gopel has been appointed manager of sales training for **Koppers Co. Inc.,** Pittsburgh. Mr. Gopel, who has been district merchandise manager in Baltimore for Westinghouse Electric Supply Co., will be responsible for operation of a new sales training program which the company is instituting. He joined Westinghouse Electric Supply as educational director in Newark, N. J., and served as branch sales manager in Newark and New York.

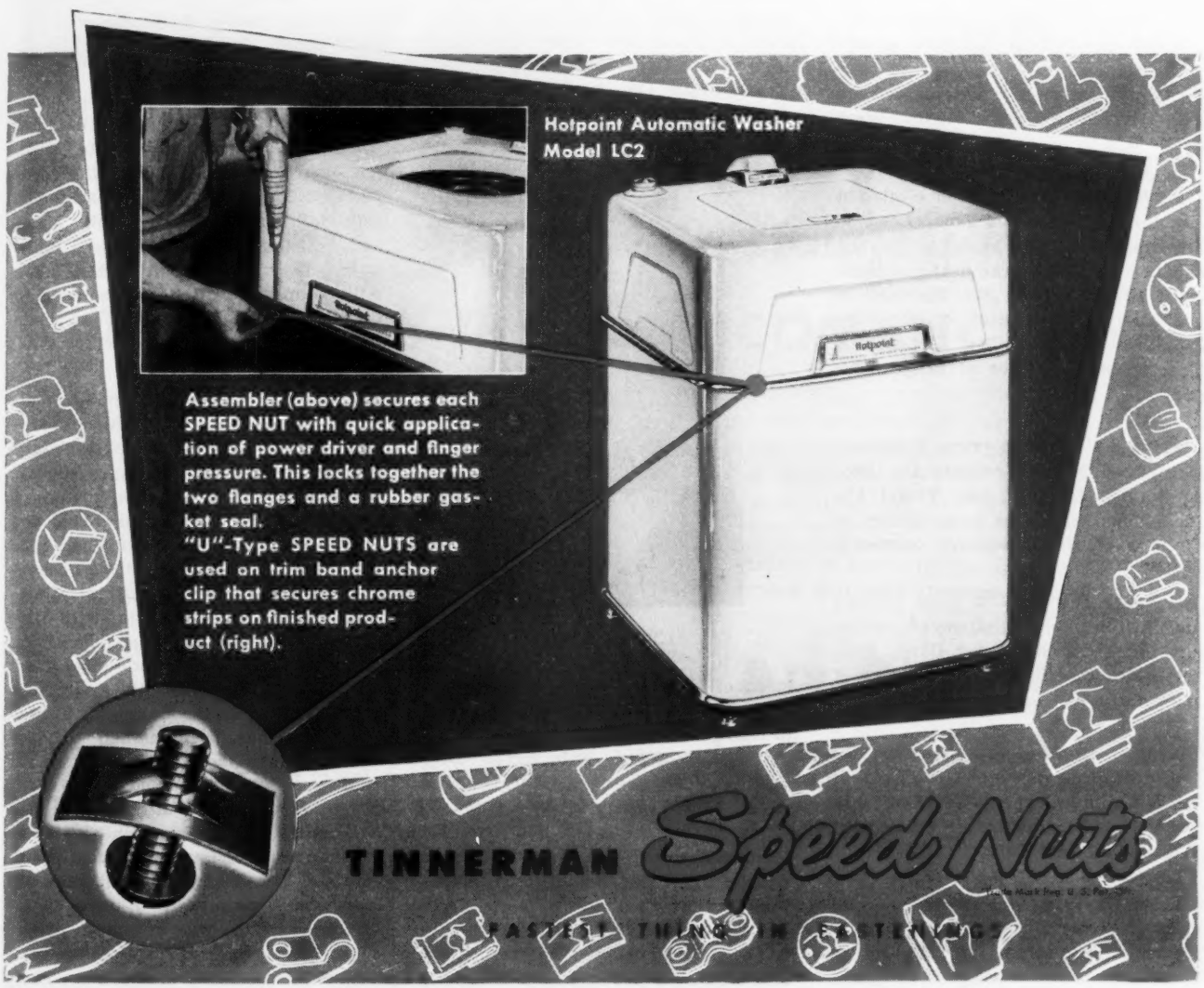
—o—

Midvale Co., Nicetown, Philadelphia, announces the following changes in its sales organization and personnel: **H. C. Lackey** has been appointed district sales manager at Chicago, with jurisdiction over St. Louis and Houston districts. He will be located at 635 Railway Exchange Bldg. **J. R. Steele** has been appointed representative in St. Louis, with headquarters in the Shell Oil Bldg. **W. L. Van Winkle** has been appointed representative in Houston, with headquarters in the Second National Bank Bldg. The jurisdiction of **A. R. Gaus,** district sales manager, Pittsburgh, has been extended to cover the Cleveland district. He will be assisted by **J. W.**

Hotpoint Switches to SPEED NUTS with Substantial Assembly Savings

Originally Hotpoint attached the lower section of its new automatic washer by means of a solid weld. Now we are using 12 Flat-Type SPEED NUTS to do the same job . . . *with a substantial saving.* The change also released welding equipment for other jobs and stepped up production by making a sub-assembly operation part of the final assembly, Hotpoint engineers report.

This is one of the many ways SPEED NUTS and SPEED CLIPS help Hotpoint keep costs down and production up. See for yourself the thousands of unique, cost-saving fastening applications performed by the SPEED NUT brand of fasteners. Your Tinnerman representative will call at your convenience. He's listed in major city phone directories. Or write: TINNERMAN PRODUCTS, INC., 2040 Fulton Road, Cleveland 13, Ohio. In Canada: Dominion Fasteners Limited, Hamilton.


Hotpoint Automatic Washer
Model LC2
Assembler (above) secures each SPEED NUT with quick application of power driver and finger pressure. This locks together the two flanges and a rubber gasket seal.
"U"-Type SPEED NUTS are used on trim band anchor clip that secures chrome strips on finished product (right).
TINNERMAN
Speed Nuts

Baer and **F. N. Satter,** the latter with headquarters in the Terminal Tower Bldg., Cleveland. **A. Richter,** formerly salesman in the New York district, has been transferred to Washington, where the office will be continued in the Hill Bldg. under supervision of **R. H. Romig.** An office has been opened in Boston in the Rice Bldg., where **Herman Bergholtz** will continue as representative under supervision of **A. H. Stewart,** New York district manager.

—o—

Willard M. Pearson has been named manager of sales, **Bond Crown & Cork Co.,** Wilmington, Del., a Continental Can Co. subsidiary.

—o—

Hartford Special Machinery Co., Hartford, Conn., announces appointment of two agents: **Joseph Windheim** will cover the Buffalo, Rochester and Syracuse, N. Y., territory, with headquarters in Rochester; **Lloyd & Arms Inc.,** Philadelphia, will cover eastern Pennsylvania, southern New Jersey, Delaware, Maryland, northern Virginia and the District of Columbia.

—o—

Phillip A. Kessler has been appointed chief engineer, **Sage Equipment Co.,** Buffalo. He will, in addition, supervise production, purchasing and estimating. He formerly was associated with West Bend Equipment Co., West Bend, Wis.

—o—

John N. Marshall has been elected a director of **American Zinc, Lead & Smelting Co.,** New York, to fill the vacancy created by the death of **Hayward Niedringhaus.** Mr. Marshall is chairman of the board, Granite City Steel Co., Granite City, Ill., and a director in a number of other companies.

—o—

Clayton D. Grover, vice president, **Whitehead Metal Products Co. Inc.,** subsidiary, International Nickel Co. Inc., New York, has been elected a director of the subsidiary company.

—o—

Ted Nagle, former New York, Detroit and Boston public relations executive, has joined **Acme-Winter Corp.,** Buffalo, as vice president and director of sales and advertising.

—o—

Dr. Paul D. Merica, executive vice president, International Nickel Co. of Canada Ltd., Copper Cliff, Ont., has been elected a director of **Babcock & Wilcox Co.,** New York.

—o—

Milton O. Lange, formerly special sales representative for Joseph T. Ryerson & Son Inc., New York, has been appointed manager of plate product sales for **Fitzgibbons Boiler Co. Inc.,** New York. He will be in charge of planning and sales of special industrial steel fabricated products such as condensers, air receivers, and heat transfer equipment.

—o—

Elmer J. Mlinar has been appointed

ELMER J. MLINAR

assistant works manager, Stamford Division, **Yale & Towne Mfg. Co.,** in Stamford, Conn. He joined Yale & Towne in July of this year, and had previous connection with Kindt-Collings Co. and the Houma Division of Weatherhead Co., as general plant manager.

—o—

Louis R. Ripley has been elected pres-

LOUIS R. RIPLEY

ident of **Heli-Coil Corp.,** Long Island City, N. Y. He had previously been in charge of automatic merchandising at Pepsi-Cola Co., Wilmington, Del., and president of United Cinephone Corp., New York.

—o—

Hamilton Corey has been appointed branch manager at Charlotte, N. C., for **Graybar Electric Co.,** New York. He will assume this post Nov. 1, succeeding **Y. P. King,** who is retiring. Mr. Corey started with the company as a service clerk in New York 27 years ago, and rose to position of manager, supply and outside construction sales, in Detroit prior to his present appointment.

—o—

A. L. Haglund, executive vice president, **Northwestern Steel & Wire Co.,** Sterling, Ill., has retired from the company because of ill health. He has been affiliated with the company for 40 years, and served consecutively for the last 21 years.

—o—

Bullard Co., Bridgeport, Conn., announces appointment of **M. K. Peck** to supervise and activate sales of the recently acquired Bullard-Universal Horizontal Boring Machine line. He was formerly connected with William Sellers & Co., Philadelphia, from 1935 to 1947 as assistant in sales with duties of service engineering. In the latter year when Consolidated Machine Tool Corp., Rochester, N. Y., absorbed William Sellers & Co., Mr. Peck was transferred to Rochester in his former capacity.

—o—

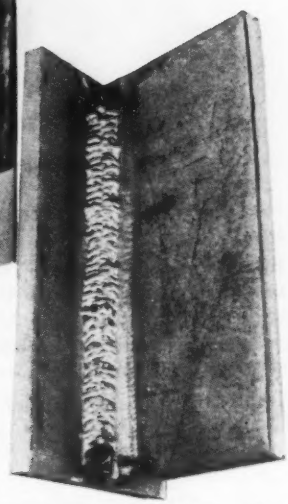
Truman Wood has been appointed general purchasing agent, **Liquid Carbonic Corp.,** Chicago.

—o—

C. Victor Mars, former sales manager, Industrial Chemical Division, **Ansul Chemical Co.,** Marinette, Wis., has been named manager of the company's New Product department. **Robert J. Yaeger** succeeds Mr. Mars as industrial chemical sales manager. In his new position Mr. Mars will co-ordinate all new product and development work which has been performed by various departments.

—o—

W. J. Webb has been appointed director of sales of the **Evinrude Motors Division,** Milwaukee, Outboard Marine & Mfg. Co. He succeeds **W. C. Clausen,** retired vice president and director of sales, who joined the Evinrude Motor Co. in 1926 as vice president and sales director and carried over in those capacities following merger of Evinrude with the former Elto Co. Mr. Webb has been sales manager of Evinrude since 1929 and associated with the company since 1924. **J. G. Rayniak,** a vice president, has been named to succeed the late **Jacob Stern** as general manager. Mr. Stern also was executive vice president at the time of his death. **Hugo Biersach** and **J. F. Furry** have resigned as vice presidents. Mr. Biersach continues as advertising manager of Evinrude, and Mr. Furry, who was in charge of the Gale Products Division, has severed connections with the company. **Har-**



Specimen of AIRCOMATIC welding stainless — vertical down.

now it can be done!

weld stainless steel with new high-speed AIRCOMATIC process

Now, stainless steels in all standard joint designs, in thicknesses of ⅛ inch plus, can be welded faster *in all positions.*

You can make single or multi-layer welds by either beading or weaving. Vertical welds can be made upward or downward. In short, the Aircomatic Process permits the welding of stainless with all the ease and versatility of ordinary steels — at a high rate of deposition and with complete freedom from slag.

Continuous feeding of filler metal, and inert gas (helium or argon) shielding, are the two main features that give this new welding method its exceptional speed and flexibility. A bare filler metal, in wire form, is fed continuously through a manually-operated gun . . . and, of utmost importance, the process deposits a weld metal with an analysis almost identical to the filler wire — even approximately 60% of the titanium in the filler wire is transferred to the deposited metal.

Investigate the many advantages this new *Aircomatic Welding Process,* for welding stainless steels, aluminum and other metals, can offer you. If you can't visit our booth at the Metal Show, but desire more information in the form of a descriptive folder, delivery and price data, fill in and mail the coupon below.

SEE THE AIRCOMATIC WELDING OF STAINLESS STEEL AT THE AIRCO BOOTH No. 2126, NATIONAL METAL SHOW, CLEVELAND, OCT. 17TH TO 21ST, 1949

AIRCO **AIR REDUCTION**

Offices in Principal Cities

Air Reduction Sales Company
60 East 42nd Street, New York 17, N. Y.

Please send me your folder (ADC-661) describing the welding of stainless steel with the Aircomatic Process and equipment.

Name_____

Address_____

Firm_____

City and State_____

old Bourdon of the Gale staff has been named manager of that division.

—o—

David C. Borlen has been appointed

DAVID C. BORLEN

works manager of **Yawman & Erbe Mfg. Co.,** Rochester, N. Y., succeeding **James R. Clark,** who has served as works manager for over 31 years and whose resignation and retirement from company activities has been announced. Mr. Borlen has been associated with the sales department of the company for many years and most recently served as manager of steel division sales under **Hugh L. Smith,** vice president in charge of sales.

—o—

William F. Chase has been elected president of the **Smaller Manufacturers' Council** of Pittsburgh, succeeding **J. Lewis Palley.** He is president and treasurer of Bearing Service Co., Pittsburgh. Other officers elected are: **E. M. Rodenbaugh,** first vice president; **D. D. Monroe,** second vice president; **L. L. Vayda,** secretary and **H. A. Calderwood,** treasurer.

—o—

Clinton W. Morgan, assistant to the district manager, Northwestern district, **Westinghouse Electric Corp.,** has been awarded the company's Order of Merit for outstanding work in the field of employee relations.

—o—

Carl E. Woodward, formerly eastern sales manager, American Metal Hose, branch of **American Brass Co.,** Waterbury, Conn., has been appointed director of sales promotion of American Brass Co.

—o—

Hyster Co., Portland, Oreg., announces the following personnel changes: **John Mitchell,** formerly retail salesman in the Hyster Chicago store, has been promoted to district manager of truck sales for the northeastern section; **John Cusick** has been named lift truck sales district manager responsible for the central portion of the United States. **W. J. O'Brien** was named district manager in the southwestern territory, **C. E. Houston** in the northwest district and **Fred Schultz** in the southeastern part of the United States.

—o—

Russell R. Thompson has returned to **McInerney Spring & Wire Co.,** Grand Rapids, Mich., as executive engineer in charge of design and development. He has more than 30 years' experience in the automotive industry, during which time he has devoted his time almost entirely to body-trim and the design and development of cushion spring constructions. Immediately preceding World War II he was with McInerney Spring & Wire Co. as product engineer and liaison engineer with the company's customers.

—o—

E. J. Cremer has been appointed

E. J. CREMER

manager of the sales and engineering office established in the Empire State building, New York, by **Binks Mfg. Co.,** Chicago. This office will be the company's principal headquarters on the Atlantic Seaboard. Mr. Cremer's duties include technical aid to those needing help in matters pertaining to spray-painting equipment, finishing or methods.

—o—

Milton T. Carleton has been appointed works manager, **Cleveland Crane & Engineering Co.,** Wickliffe, O. He was works manager of the Cleveland Division, E. W. Bliss Co., for 14 years, and has a background of over 35 years in all phases of heavy machinery manufacturing.

—o—

James F. Crough has been appointed western representative, Hydraulic Power Division, **Hydraulic Press Mfg. Co.,** Mt. Gilead, O. He will have headquarters in San Francisco and will handle both marine and industrial applications of hydraulic pumps, fluid motors, valves, controls and power units.

—o—

Lock Thread Corp., Detroit, has elected **H. P. Ladds** to its board of directors to succeed the late **Charles F. Newpher.** Mr. Ladds has been president and a director of National Screw & Mfg. Co., Cleveland, since 1939.

—o—

W. E. Madden, recently elected vice president, has now been made general sales manager of **George Haiss Mfg. Co. Inc.,** New York, division of Pettibone Mulliken Corp., Chicago.

—o—

John L. Warner, assistant superintendent at the South Chicago coke plant of **Youngstown Sheet & Tube Co.,** Youngstown, has been elected secretary of the Blast Furnace & Coke Association of the Chicago district.

—o—

Darwin E. Hachat, former general foreman of the Power Division, has been promoted to superintendent of power at the Indiana Harbor plant of **Youngstown Sheet & Tube Co.,** Youngstown. He has been with the company 20 years.

—o—

Metal Hydrides Inc., Beverly, Mass., announces addition to its research staff of **Dr. M. D. Banus** to replace **Dr. Albert E. Finholt,** resigned as associate director of chemical research.

—o—

R. P. Snyder has been appointed

R. P. SNYDER

chief engineer, **Harbison-Walker Refractories Co.,** Pittsburgh, effective Sept. 30 when he succeeded **D. B. Hendryx** who resigned to establish his own office for engineering and consultant work. Mr. Hendryx will also do some consultant

work for Harbison-Walker. Mr. Snyder has been associated with Harbison-Walker Refractories Co. and Northwest Magnesite Co. for the last 16 years.

—o—

John E. Morrison has been placed in charge of **Link-Belt Co.'s** newly opened district sales office in Duluth, 422 Board of Trade Bldg. He formerly was district sales engineer in Chicago and Minneapolis. He will be assisted in Duluth by **Harold A. Ivarson,** who has been transferred from the Minneapolis plant, where he handled the city desk and called on local customers.

—o—

H. R. Singleton, former sales manager, Electric Division, has been promoted to general sales manager for all products of **A. J. Lindemann & Hoverson Co.,** Milwaukee.

—o—

David S. Holbrook has been elected executive vice president of **Algoma Steel Corp. Ltd.,** Sault Ste. Marie, Ont., Canada, and has also been named to the board of directors.

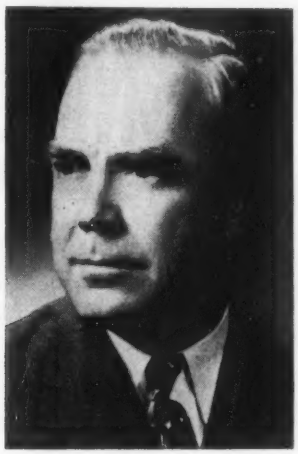
—o—

Joseph A. Ashwell has retired as director of purchases for the **New Departure Division** of General Motors Corp., Detroit, because of ill health. **Lester A. Lanning** has been appointed acting general purchasing agent. **Lad Landau** has been named manager of steel export department at **Mauray I. Cohen,** New York. He had previously been with Mercantile Metal & Ore Corp. in a similar capacity.

—o—

David C. Minton Jr., assistant to the director, **Battelle Memorial Institute,** Columbus, O., has been named executive in charge of sponsor relations and projects development. He will act in a liaison capacity between Battelle and industrial and governmental sponsors conducting research at the institute.

RALPH C. MARK



WALTER S. MARDER

Ralph C. Mark has been elected comptroller, **General Motors Corp.,** Detroit, succeeding the late **R. E. Hammond.** Mr. Mark joined the corporation in 1931, and since 1947 has been director of the cost analysis section, comptroller's staff. **Richard C. Gerstenberg** has been appointed assistant comptroller. He has been director of operations analysis section, comptroller's staff, since 1947. **James L. Conlon** was appointed general manager, Ternstedt Division, succeeding **John W. Jackson** who is on leave of absence. Mr. Conlon, who has been resident manager of Ternstedt plant in Columbus, O., since 1945, will make his headquarters in Detroit. **Paul L. Jones,** works manager of the Ternstedt plant in Columbus, succeeds Mr. Conlon as resident manager.

—o—

Raymond C. Miller has been appointed director of the **Office of International Trade,** Washington, succeeding **Thomas C. Blaisdell Jr.,** who became assistant secretary of commerce in April. Mr. Miller was economic counselor at the U. S. Embassy in Brussels, Belgium in 1947 and subsequently was on loan to ECA.

Walter S. Marder has been appointed assistant to the president of **Daystrom Corp.,** Olean, N. Y., subsidiary of ATF Inc., Elizabeth, N. J. He has been associated with the ATF organization 26 years and with Daystrom for the last two, serving as comptroller, and most recently assistant vice president. In his new position Mr. Marder will make his headquarters in Olean.

—o—

Lloyd D. Shand has been appointed as a sales representative in the New Jersey territory for **Monsanto Chemical Co.,** St. Louis, and **Daniel P. Shedd** to the post of sales development representative to succeed Mr. Shand.

—o—

H. S. Hall has been appointed assistant manager, combustion control department of **Morgan Construction Co.,** Worcester, Mass. He previously was fuel engineer of Lukens Steel Co., Coatesville, Pa.

—o—

William Schramm has been named chief engineer and superintendent of manufacturing for **Woodruff & Edwards Inc.,** Elgin, Ill., and **Richard Hampel** will assist Mr. Schramm.

OBITUARIES...

Bruce E. Tau, 53, vice president, **Freyn Engineering Co.,** Chicago, died Sept. 24 in Pittsburgh while on a business trip. He joined the company in 1931.

—o—

Warren J. Hannum, 65, recently retired vice president and general manager, Libby Division, **International Detrola Corp.,** Detroit, died recently. He joined that company in 1940 after serving many years with Gisholt Machine Co., Madison, Wis.

—o—

Warren G. Jones, 33, vice president, **W. A. Jones Foundry & Machine Co.,** Chicago, died Sept. 16.

—o—

Benjamin F. Lambert, 61, manager of coke sales, **Diamond Alkali Co.,** Cleveland, since 1927, died Sept. 21 of a heart attack.

—o—

R. T. Faucette, president, **Chattanooga Wheelbarrow Co.,** Chattanooga, Tenn., died Sept. 3.

—o—

Joseph D. Cotton, 75, vice president and director, **Four-Wheel-Drive Auto Co.,** Clintonville, Wis., died Sept. 23.

—o—

Earl N. Griffy, 50, assistant sales manager, **General Dry Battery Co.,** Cleveland, died Sept. 25.

—o—

George H. Dixon, 61, a design engineer for **Bryant Heater Co.,** Cleveland, died Sept. 25.

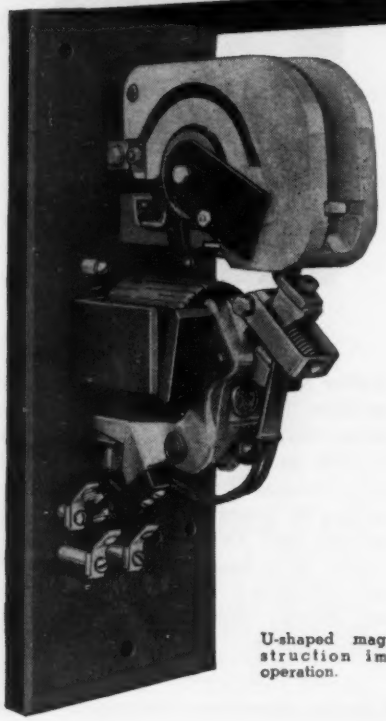
—o—

Herbert Tuchel, 42, general foreman, **Inland Steel Products Co.,** Milwaukee, Inland Steel Co. subsidiary, was drowned in the Fox river, Green Bay, Wis., Sept. 25.

—o—

Harry H. Henry, 55, vice president, **Monark Silver King Inc.,** Chicago bicycle manufacturer, died Sept. 24 of a heart attack.

EC&M LICKS THE DUST PROBLEM



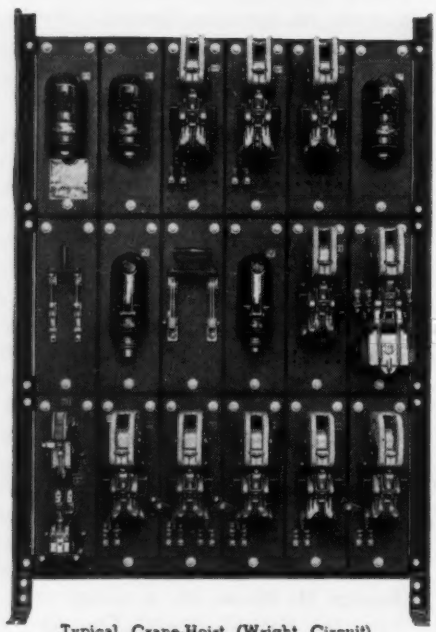
U-shaped magnet construction improves operation.

LINE-ARC CONTACTORS HAVE BALANCED MAGNETIC CIRCUIT, ARE THE *FIRST* TO ELIMINATE THE HINGE-PIN FROM THE MAGNETIC-PATH

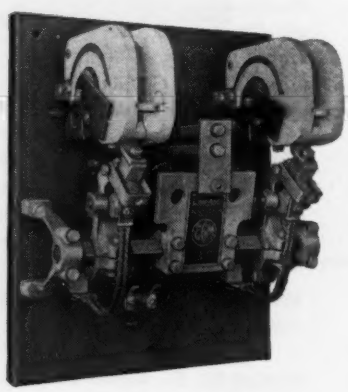
In the *improved* EC&M LINE-ARC Contactors, high arc-rupturing ability is retained—long-life, current-carrying parts remain unchanged—but a new magnetic-circuit reduces upkeep by eliminating dust accumulation at the pivot-point.

In previous design contactors the hinge-pin is in the magnetic-path, causing magnetic particles to cling around the main bearing. Under repeated operation, the dust packed in the narrow gap at the pivot-point, necessitating its removal manually. Now—dust is free to fall away from the vertical pole-faces in the magnetic circuit of the improved LINE-ARC Contactors.

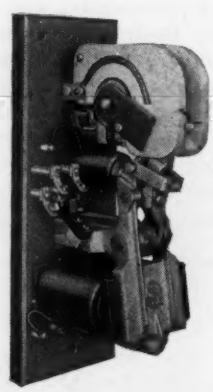
The performance of the 600-ampere size contactor, has proved the advantages of two operating-coils for fast operating results. This double-coil feature, giving high-speed operation, is now also incorporated in all 300-ampere contactors, in the 150-ampere, double-pole contactor, and in all sizes of spring-closed contactors. For quick responding, low up-keep cost magnetic control, specify EC&M LINE-ARC Contactor Control.



Typical Crane-Hoist (Wright Circuit) Controller with improved LINE-ARC Contactors.



Double-pole contactors for 2-motor drives insure equal division of the load and uniform accelerating and plugging currents.



Spring-closed contactors use self-lubricating bearings and steel bearing pins in place of the knife-edge construction previously used.

EC&M BUILDS THE WORLD'S FASTEST 600-AMPERE CONTACTOR

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • • CLEVELAND 4, OHIO

Engineering News . . . AT A GLANCE

PINPOINT TROUBLE AREAS—Corrosion doesn't have to be visible to the naked eye to be damaging. In case of antifriction bearings, for example, points of corrosion so small that aid of a magnifying glass is required to see them, may cause bearings to be classed as rejects by the manufacturer. These pinpoint-size corrosion areas might bring about eventual destruction of the bearing if placed in service. This form of rust originates during manufacture and, according to Esso Standard Oil Co., is particularly common when emulsions or soda water are used during machining. Trouble is not confined to bearings. It may occur during machining of crankshafts, piston pins and many other parts—spreading very rapidly if not stopped immediately.

PIANO-WIRE CONVEYORS—Conveyors that use piano wires as the carrying medium are employed by Baltimore Porcelain Steel Corp., to prevent enamel from adhering to parts being processed through its final-coat enamel line. Table tops and other parts are placed bottom up on the conveyor at the start of the line. After the bottom is sprayed each table top is turned over by hand to expose the top side. A second wire cable conveyor then carries the work through a final spray booth and into a dryer prior furnace firing.

NEW REAMER PROCESS—Cutter blades of high speed steel are anchored firmly in recesses of low carbon steel reamer bodies by means of a rolling process currently employed by Hasley Products Co., Farmington, Mich. An entirely new procedure, the technique involves no application of heat. Furthermore, worn tools can be restored to original sharpness and diameters by reprocessing through the new method.

SMALL BUT "MIGHTY"—Manufacturers that use permanent magnets in their products now may use smaller magnets to perform the same functions formerly done by larger units, according to General Electric Co., Pittsfield, Mass. Change in the permanent magnet manufacturing process, it is reported, resulted in a product that provides highest external and residual induction of any permanent magnet material known today. Crystal structure of the new magnet, it is pointed out, is aligned in direction of magnetization.

MATHEMATICIAN'S DREAM—All mathematical problems, from elementary to the most complicated, are handled with simplicity and ease by a fully automatic calculator developed by Friden Calculating Machine Co. Inc., San Leandro, Calif. Its operating features facilitate handling of payrolls, invoices, inventories and tax compilations, computing not only individual extensions, but also final results.

"FLYING" RECORDER—A mechanical "flying stenographer" capable of recording 200 pieces of information simultaneously and continuously on a 6-inch steel tape was perfected for the Navy's Bureau of Ordnance at United Aircraft Corp.'s research department, East Hartford, Conn. Developed to accompany guided missiles on high-speed flights, the 46-pound device records such factors as air pressure, temperature, speed and position by electrical signals from scores of instruments on the 150-foot tape.

NEW CASTING METHOD—Intensive research on castings and casting techniques on the part of the Navy in collaboration with Alloy Engineering & Casting Co., Champaign, Ill., uncovered many developments. Specifically directed for experimental production of bladed and shrouded steam turbine wheels cast integrally, and for jet engine rotors cast with and without inserted blades, it evolved practical and economic improvements in centrifugal and centripetal casting. Of metallurgical significance is the fact that for the first time in a large casting a fine-grained center was obtained. (p. 68)

"DOUBLE HEAT TREAT"—Combined carburizing-martempering setup, employed by Evinrude Motors, Milwaukee, to process motor boat crankshafts, handles 110 charges per day to give an hourly rate of 5 charges. It heat treats work through medium of four salt baths and, during the 22-hour day it operates, provides accurate control and uniform carburization of all surfaces with assured penetration. Each of the 11 fixtures used in the 44-foot furnace is loaded with 10 to 20 crankshafts. (p. 72)

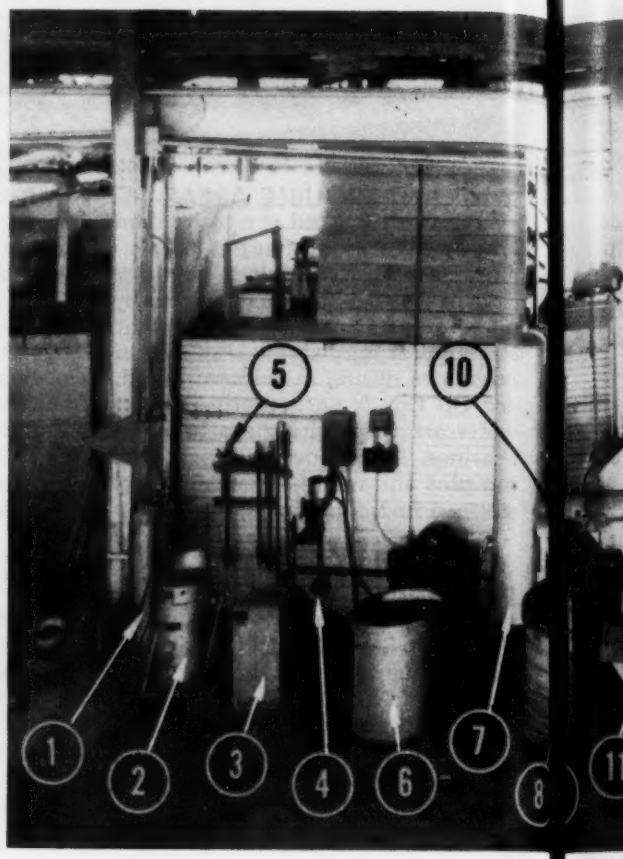
HEAVY VS LIGHT COILS—Several good reasons exist for using coiled strip of small weight and width in slitting operations. One is thin stock—so thin that edges are damaged easily. While still in the slitting line, stock may be distorted or damaged while being pulled between separators. Likelihood of damage from this increases with the width of the original stock and number of strands being cut. Explanation is that increased width and fanout cause individual strands to be pulled between the separators at a slight angle, thus tending to squeeze edges of strand against the separator edges. (p. 75)

DRY BLAST STILL SHELVED—Some 10 years ago, 20 blast furnaces were operating under a system devised to condition the air blast so minimum amount of moisture was involved. Theory was to control moisture due to humidity. The dry blast may have some value in regions subject to high and variable humidity or in some special practices where both high hearth temperature and coke consumption are required. (p.84)

Advanced CASTING METHODS

. . . expected to result in more economical foundry practice and better castings

Practical, economic improvements in centrifugal and centripetal casting processes have been evolved in an intensive Navy research program aimed at developing satisfactory methods for producing shrouded steam turbine wheels cast integrally and jet engine rotors cast with and without inserted blades. Work is facilitated by highly specialized molding, centrifugal casting, dielectric and induction machines and complete ceramic department



THROUGHOUT U. S. Naval history, the Navy has been one of the largest users of castings purchased from industrial foundries. Navy technical specifications have been directed at improved metallurgy, physical properties, soundness and, above all, dependability and functional utility, ranging from pumps and propellers through turbine housings and gearing, from motor frames to periscope parts, and from porthole frames to deck hardware. The Bureau of Ships uses an infinite variety of castings, some 90 per cent of which are purchased by Navy suppliers of ship components. It has special requirements for new developments in gas turbines and heat-resisting alloys, as well as extensive applications for corrosion-resistant alloys.

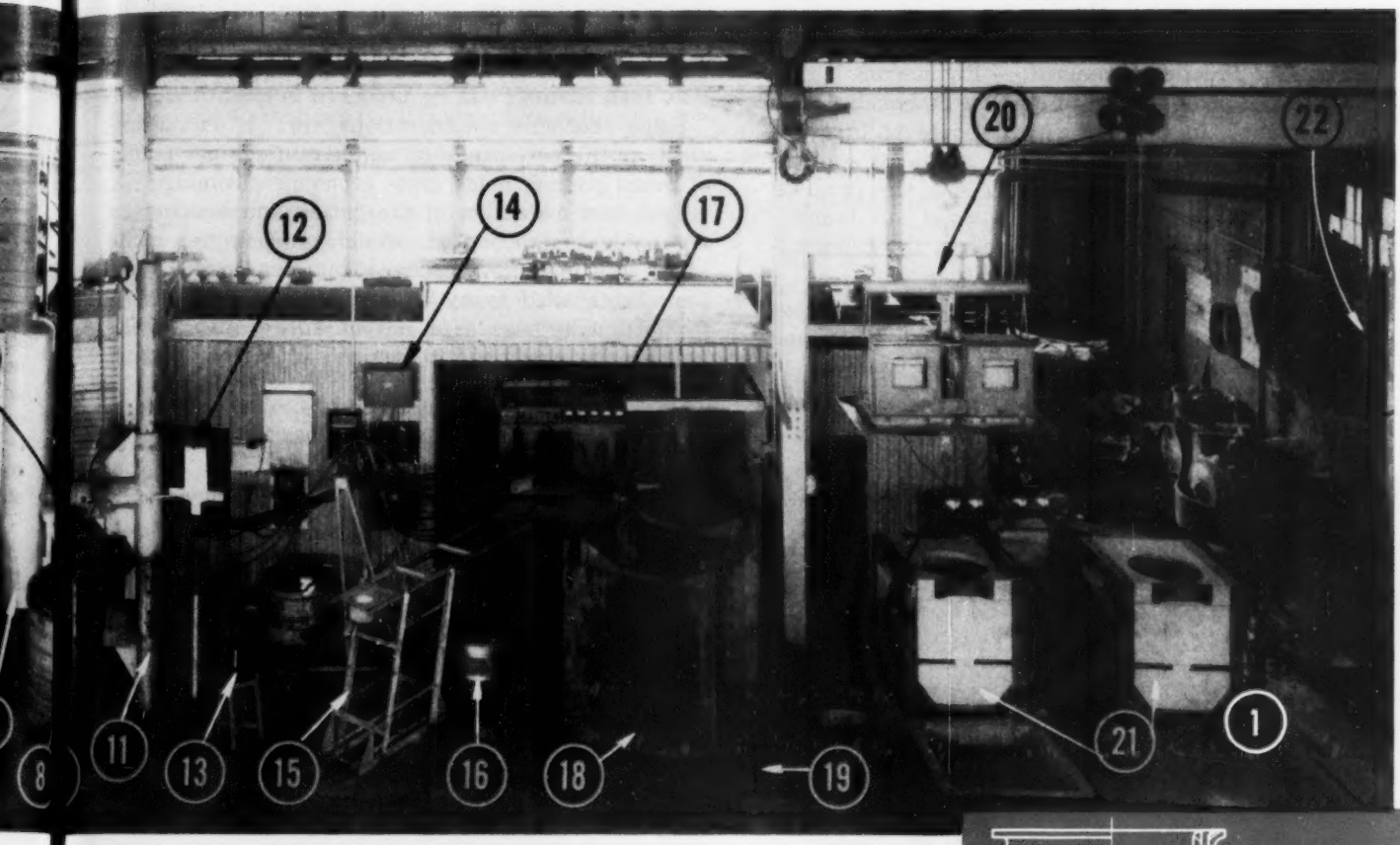
The Bureau of Aeronautics in aircraft engines, superchargers, and particularly in the new jet and gas turbine engines, has been confronted with geometrically expanding demands and requirements for new and better alloys. As technical frontiers are crossed in quest of heat-resisting alloys and super high-strength materials to meet heretofore unknown requirements, castings are playing a more important role than ever before. On technical and metallurgical advances, making possible increased power, speeds, and dependability in aircraft, much of the striking power of the Navy and national security may well depend.

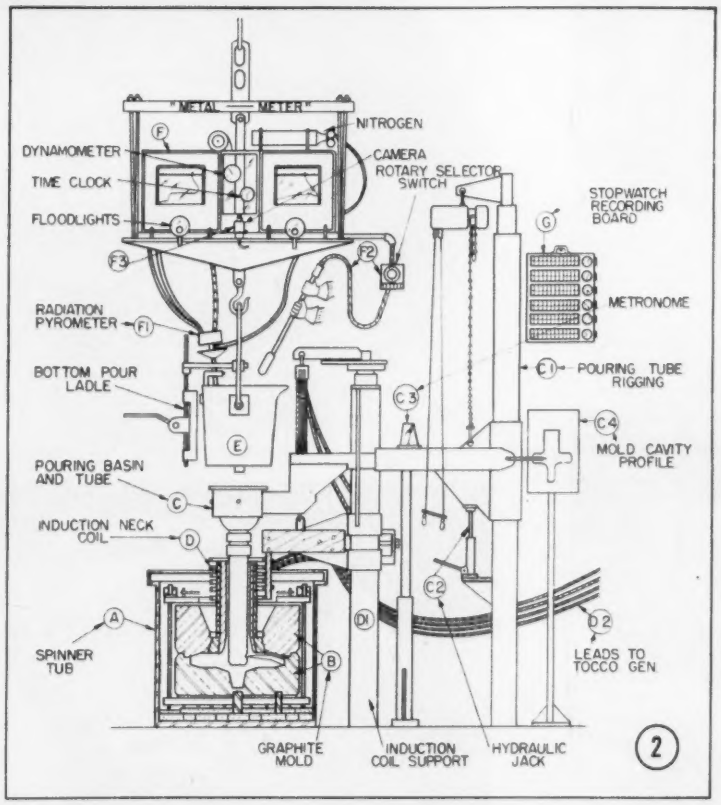
In keeping with this objective, the Navy entered into a contract with Alloy Engineering & Casting Co., Champaign, Ill., to conduct intensive research on castings and casting techniques. Work on the contract began in June, 1947, and is scheduled to terminate formally October 31, 1949. For several years preceding this contract, the company had been carrying on extensive research and development, including much practical application of some phases of this type of work.

Many Inventions Result—This contract has been directed by H. H. Harris, president, General Alloys Co., Boston, which company has participated in several phases of the development and has loaned personnel both with and without compensation on the project. It has also done considerable related work without cost to the Navy. There are many inventions and developments on which patents are pending or will be applied for. On patents obtained as a result of work preceding the contract, the Armed Forces will be licensed. On those covering developments on the contract, the Armed Forces will be fully licensed and the commercial rights for nondefense industrial application will remain with the inventors and their assigns.

This project is technically and specifically for the experimental production of bladed and shrouded steam turbine wheels cast integrally, and for jet engine rotors which are cast with and without inserted blades.

Present method of producing the bladed steam turbine rotor is to mill the blades and machine the wheel from one piece, with exception of the outer shroud which is attached to extensions of the blades with the blades passing through the shroud section and riveted over. This method is very costly. A one-piece wheel would be a decided improvement. Either type of wheel can be cast with two or more alloys





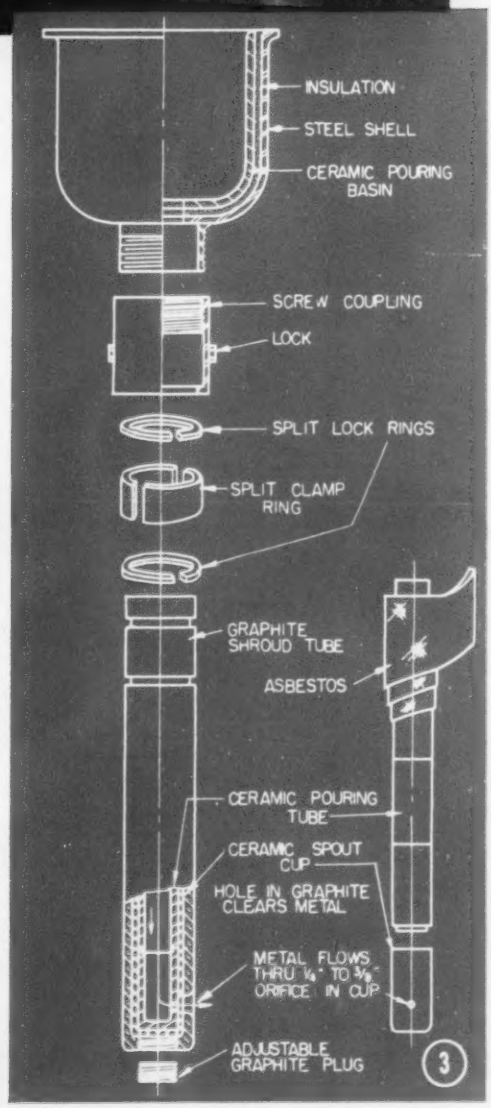


Fig. 1—General view of advanced casting facilities which include three centrifugal casting machines of 28, 40 and 72-inch diameters. Key to equipment is explained in the text

Fig. 2—Sketch showing details of master casting machine and its auxiliary equipment

Fig. 3—Constructional details of trajectory pouring tube and pouring basin

poured sequentially to form hub, web or blades, on equipment designed in the project.

Foundry Practice Examined — Engineering objectives of the project were to develop practical, economical methods in the middle ground between precision investment casting processes and advanced contemporary foundry practice. To this end, the program embraced a most thorough research of foundry practice from ancient through modern times, including enemy arts and wartime innovations.

Economics—It is essential wherever possible that any new materials, methods, processes, controls and equipment be so developed as to lend themselves to economical as well as technical ends. It is anticipated that casting research and development will result in lighter, stronger and more serviceable castings at a lower cost in ratio to their service performance; also, that such castings can be produced in quantities.

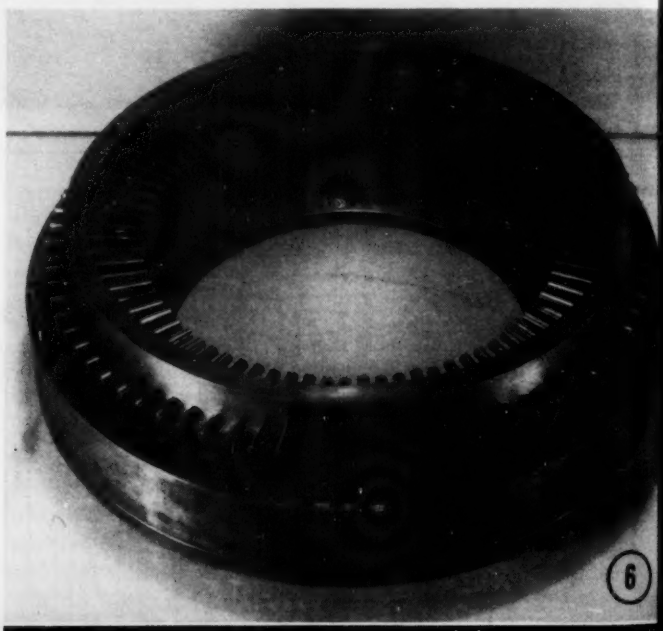
Some economic considerations are: 1. Increasing yield, or the percentage of usable castings per pound of metal poured, holds great economic advantage. A 40 per cent reduction in the gating and heading or nonusable metal poured, would produce the same usable castings now produced on five heats, from four heats with many great incidental economies. Proportionally increased output for a given melting capacity would add to available emergency casting

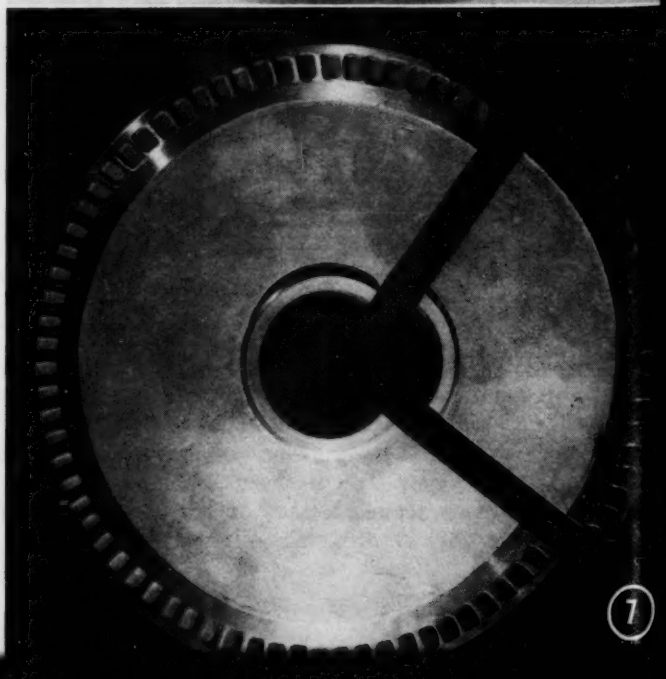
Fig. 4—Pouring into pouring basin which terminates in controlled trajectory spout. As pouring progresses, tube is raised hydraulically

Fig. 5—Solidification is checked by plunging a series of probes into the head

Fig. 6—Corebox for 79-blade shrouded steam turbine rotor made for preliminary studies of gating, metal flow and shrinkage

Fig. 7—Rough-machined one-piece shrouded turbine rotor





capacity. 2. Substantial economies on floor space, materials handled, cleaning, machining, and scrap, should logically result from envisioned improvements in foundry practice. 3. Broader application of improved castings for defense may broaden markets for industry to general economic benefit.

Equipment—First step in initiating work under the Navy contract was to install the necessary laboratories and equipment needed to study such subjects as method of producing castings, mold and core materials, pouring and gating, metal and mold temperatures, mold atmospheres, pouring rates, metal cleanliness and structure.

Present equipment includes a ceramic laboratory, a ceramic workshop and kiln room, a tool and die shop and a casting production line. Three Pittsburgh 'Lectromelt electric arc furnaces of 400, 1000 and 3000 pounds, respectively, were available in the plant; these supply metal requirements. For induction heating of molds or selected mold areas, for induction heating of ladles, and melting under vacuum or controlled atmosphere, 200 kw of 3000-cycle power is utilized.

A study in flow of mold materials under pressures applied from one or more directions and by different speed-pressure variations with and without vibration was implemented first with a specially built pneumatic jolt-squeeze push-off machine coupled to a 600-pound air compressor; and second, with a 60-ton floating-head hydraulic press with a 36 x 36-inch square table tied in with jolt-rollover machine, a 100-ton double-acting toggle press.

The ceramic laboratory is equipped for pulverizing, grading and coating small particles of sand, oxides, ceramics and a variety of materials including synthetic sapphire which has been used in particle size to 0.4 micron. Vacuum heat and vibration are combined in a special machine to dry and wet microparticles individually prior to coating and mixing them with bonding materials which adhere in clusters and produce surface irregularities. (Capillary action and atmospheric moisture prevent coating of particles.)

Dielectric Heating—A conveyorized dielectric heater developed on the contract for drying cores and molds, and for specialized heat applications, has an output of 35 kw, 40 megacycles, and has an automatic electronic circuit for varying power output to offset decreasing loss-factor. It has 85 kw transformer capacity and is designed for ultimate 105-megacycle operation. Capacity is 1500 pounds of cores per hour. Heater can bake, cure, or fire various materials.

Because of the small volume of sand employed in a new type of mold developed on the project and the great reduction in size, weight and section of the molds, advantages of dielectric mold drying can be applied economically. Such molds require no flasks, in most forms no core plates, and cores either require no core dryers or can be processed on a very small number of core dryers produced from plastic or the core material itself. The drying cycle for small cores, ranging from pin cores up to molds approximately 2 feet square and 4 inches (*Please turn to Page* 97)

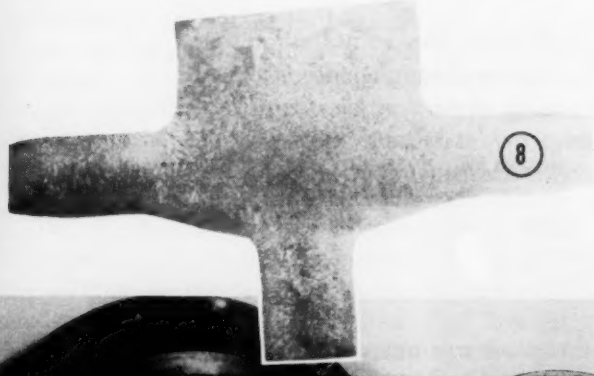


Fig. 8—Slab cut through center line of gas turbine rotor disk showing extremely good structure

Fig. 9—Assembly of corebox patterns for casting BuShips 79-blade shrouded steam turbine rotor. Explanation of key is given in text

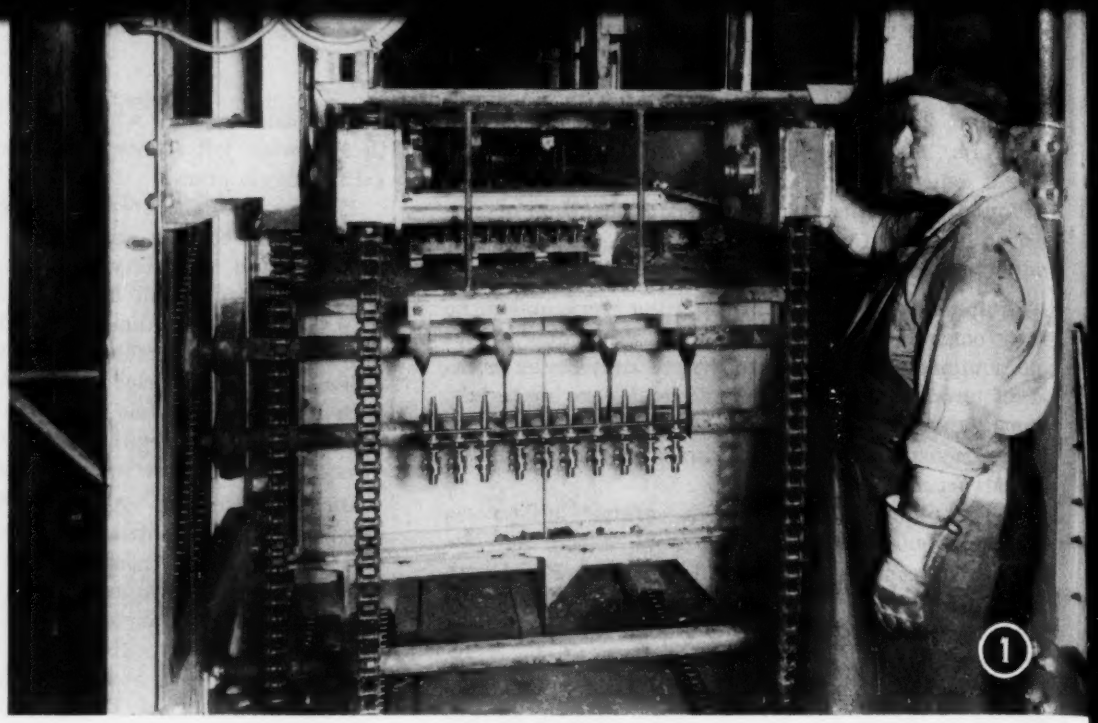


Fig. 1 — Charging end of conveyorized electric salt bath carburizing furnace with ten outboard motor crankshafts racked in fixture ready to start on automatic heat treating cycle

CARBURIZING-MARTEMPERING PR

Streamlines Crankshaft Heat Treating

One of the first practical commercial installations, the combination heat treating setup at Evinrude accomplishes its mission through medium of salt in four baths. Besides substantially decreasing distortion of drop-forged shafts, this one-operator supervised method provides close control and uniform carburization of all surfaces with assured penetration

By JOSEPH J. EBNER
Factory Manager
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Milwaukee

WORLD WAR II interrupted, among boating enthusiasts, fishermen and others, a steadily growing popularity for outboard motors. Since production of these power units had to be suspended under the necessity of governmental restrictions, it was obvious that a tremendous volume of orders would confront manufacturers after the end of hostilities. As a consequence, prewar production facilities were soon found inadequate to accommodate postwar motor demand.

Among outboard engine manufacturers facing this situation was Evinrude Motors, Milwaukee, a division of Outboard, Marine & Mfg. Co. Surveying its problem, the company found its principal bottleneck was in its heat treating department, specifically in the carburizing of motor crankshafts. To overcome this, the company in 1945 installed in a new crankshaft production line a conveyorized Ajax Hultgren electric salt bath furnace for carburizing and martempering shafts.

First Commercial Use—The furnace installation was claimed to be the first commercial application of combining carburizing and martempering and from that standpoint was unique. Several other plants are now understood to be using this process but to date details of operation have not been publicized. This equipment was selected by Evinrude to streamline flow of work in process and to eliminate as many operations as possible.

Extensive pilot runs made by the equipment manufacturer demonstrated that combining of the carburizing and martempering treatments was practical and would provide the following advantages: (1) It would make possible a single handling of the work through the complete treatment with a single operator; (2) provide accurate control and uniform carburization of all surfaces with assured penetration; (3) effect a substantial decrease in distortion and thereby simplify and minimize the straightening problem; and (4) it would comprise a compact, totally-enclosed unit located in the center of the machine shop, minimizing work handling. The installation fulfilled all of these expectations.

Four-Bath Procedure—Equipment, shown in Figs. 1 and 2, was built by Ajax Electric Co. Inc., Philadelphia. It is 44 feet long, 7 feet wide and stands

Fig. 2 — In background is side and back end of carburizing furnace. Unit, which stands in crankshaft production line, is almost completely enclosed to facilitate fume removal

NG PROCEDURE

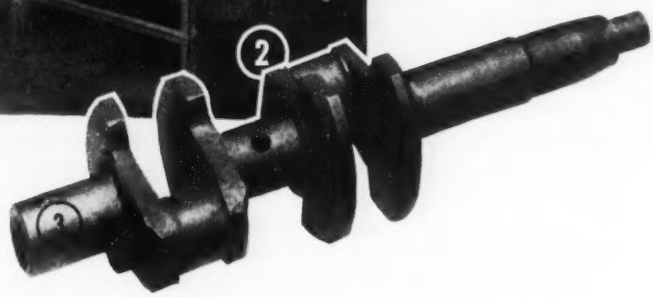


Fig. 3—Crankshafts, drop-forged from carburizing type steels, are about 1 foot long. Weight averages 2¼ pounds each. They are carburized to a case depth of 0.035 to 0.040-inch

approximately 21 feet high. Heat treating is accomplished through the medium of salt in four baths maintained at required temperatures by passing through the salt electric current introduced into the bath by means of electrodes; each bath having a designated temperature for a specific purpose.

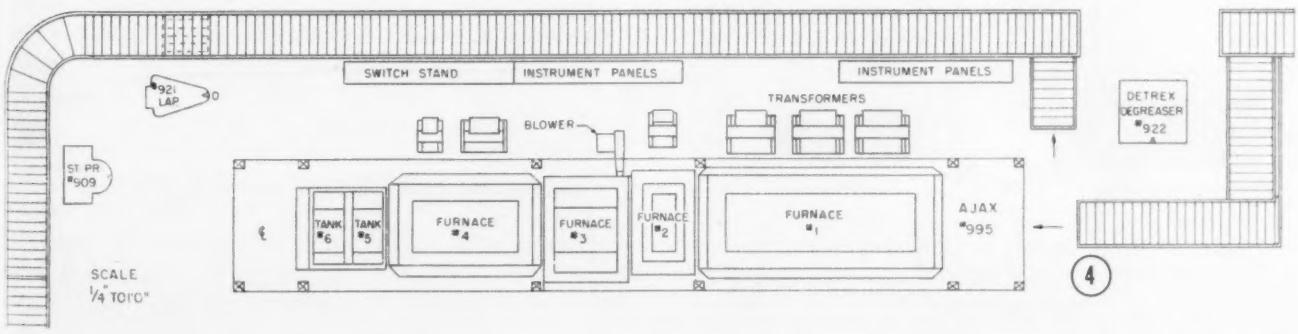
The four baths are the carburizing bath operating at 1760° F, stabilizing neutral wash bath at 1450°, isothermal quench at 400° and draw bath at 450°.

In addition to the four salt baths, the installation includes two hot water rinse tanks. The furnace is approximately 85 per cent enclosed, with sheet metal comprising sides and a hood. Fumes are exhausted from the latter by a 5-horsepower motor-driven fan and blower through three pipes to outside atmosphere.

The crankshafts, one of which is shown in Fig. 3, are drop forgings made from carburizing grade alloy steels. Standard steel types are SAE 4615 and SAE 3120, although SAE 4620 and NE 8617 are used upon occasion. Shaft dimensions approximate 2½ x 11¼ inches and weights average 2¼ pounds. Operations performed on the shafts before heat treatment include grinding, milling, turning and broaching. For salt bath carburizing, no preparation of the shafts is necessary other than thorough cleaning. This is accomplished by passing the shafts through a Detrex degreasing machine in the crankshaft line.

Shafts Carburized All Over—Former carburizing practice utilizing electric gas carburizer and box-type furnaces involved copper plating of the shafts to provide selective hardening. In the salt bath process it was decided to carburize all over and to thread the end of the shaft after treatment by grinding the threads. This is not objectionable since grinding pro-

Fig. 4—Plan view of salt bath carburizing furnace shows the four salt and two water rinse tanks. Travel of crankshafts through furnace requires about 5½ hours



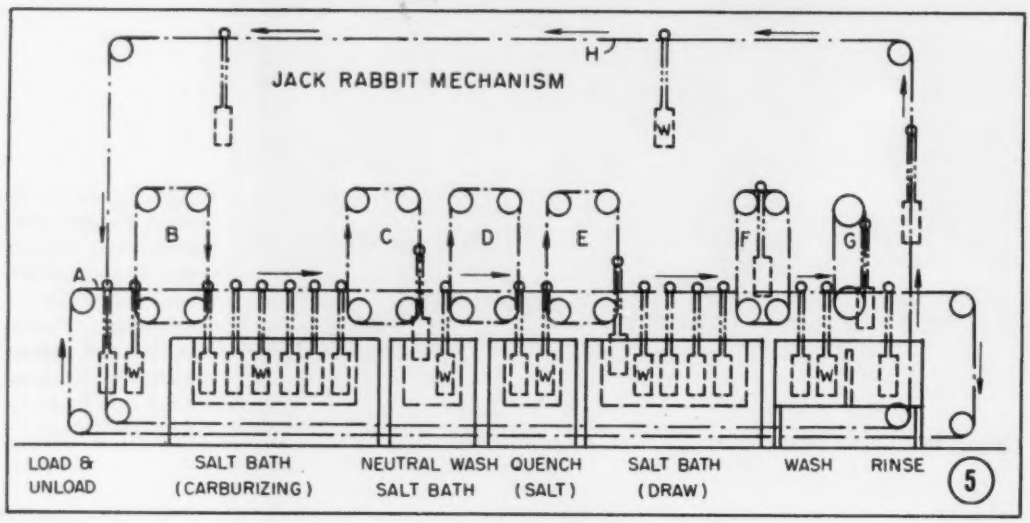


Fig. 5 — Schematic arrangement of chain conveyors in furnace showing flow of work through unit from left to right

duces a superior thread on the finished part.

After being degreased, cleaned crankshafts are placed in tote pans and delivered on a roller conveyor table to the charging end of the Ajax Hultgren furnace. Here the operator of the furnace loads from 10 to 20 crankshafts, the number depending upon crankshaft size, into one of 11 fixtures which operate in conjunction with the furnace chain conveyor system. Fig. 1 shows a fixture loaded with 10 shafts, ready to start through the heat treating cycle. The fixtures are welded heat-resisting alloy racks in which the crankshafts are held in upright position as they move through the four salt baths and two water rinses automatically.

Mechanized Furnace Handling—Fig. 4 shows a plan view of the furnace and Fig. 5 is a sketch from the right elevation detailing the chain conveyor system. The loaded fixture, W in Fig. 5, moves forward into the furnace on chain conveyor A until it comes into contact with chain conveyor B where fingers attached to the chains of the latter lift the fixture from conveyor A. Moving upward, horizontally and then downward on chain conveyor B, the fixture and work are lowered into the carburizing bath, furnace No. 1 in Fig. 4, the fixture again resting on chain conveyor A.

Moving forward very slowly on conveyor A, the work is immersed for a period of 2 hours 40 minutes, during which time a carburized case ranging in depth from 0.035 to 0.040-inch is imparted. The salt bath is 18 inches deep, 40 inches wide and 10 feet 8 inches long, and the salt employed is Park Kase No. 1 maintained at 1760° F.

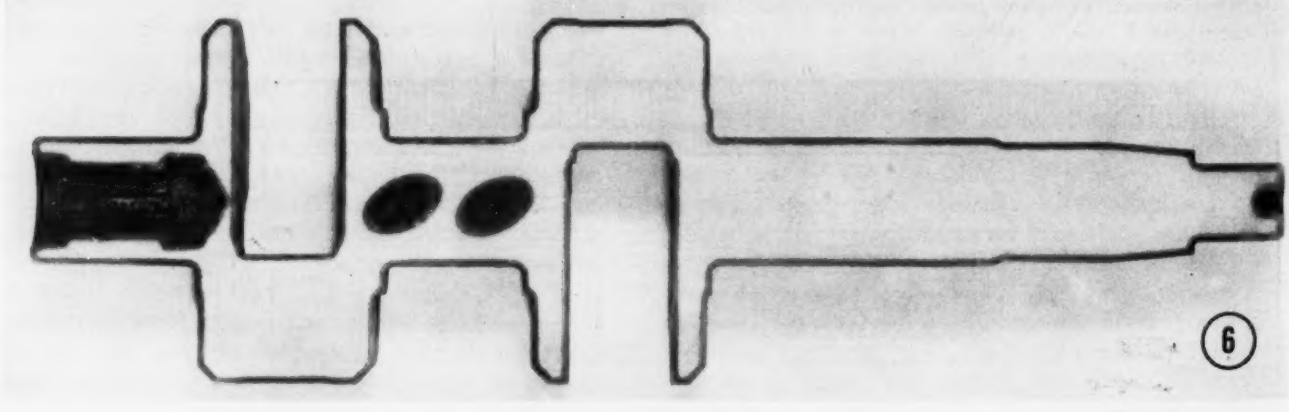
Upon completion of its travel through the carburizing bath, the fixture moves under chain conveyor C, is lifted out of the bath and deposited once more on conveyor chain A in the stabilizing or neutral wash bath, furnace No. 2 in Fig 4. Here the crankshafts remain immersed for 7 minutes in NuSal at 1450° F. This bath is 18 inches deep, 39 inches wide and only 18 inches long.

Removed from the stabilizing bath by chain conveyor D, the loaded fixture is now deposited in the isothermal quench or normalizing bath, furnace No. 3 in Fig. 4. The bath material is low temperature draw salt held at 400° F, and the work remains submerged for 7 minutes. This bath is 26 inches deep, 59 inches wide and 42 inches long.

Next step is for the fixture and crankshafts to be transferred by chain conveyor D into the draw bath, furnace No. 4 in Fig. 4, which contains low temperature draw salt heated to 450° F. Immersion in this bath is for 2 hours and 20 minutes, after which the work has a hardness of Rockwell 58-60 C-scale.

Lowers Shaft Temperature—Previously-mentioned suction fan and blower which exhausts fumes from the furnace hood serves (*Please turn to Page* 94)

Fig. 6—Macroetched cross-section of outboard motor crankshaft indicating uniformity and thickness of carburizing case



ROTARY GANG SLITTING

An Effective Production Tool

Time studies on a wide range of coil sizes point up economy of operating small slitting line units and reveal several significant facts relating to slitting line operations in general. Techniques used to slit flat sheets, scrap disposal methods and equipment required to slit narrow strands are also discussed in this second part of the current article

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PART II

TIME STUDY, Table III, is a continuous record, covering a period of about 2 months, of slitting jobs done on a medium-sized pull-slitting line capable of making up to seven cuts in stock 0.094-inch thick and 24 inches wide. The line was operated by a crew of two men, and a fork truck was used for both loading and unloading purposes.

Total cycle time includes loading the uncoiler, threading strip through slitter to recoiler, attaching cut strand or strands to the recoiler; placing and locking separators on the drum; slitting; single banding and stripping from the drum; loading on fork truck. Banding subsequently is completed away from the recoiler, in a separate operation. The total weight of the coils handled was over 1 million pounds.

It should first be noted that coil weights vary all the way from 80 pounds up to 4082 pounds, stock thicknesses from 0.0135 up to 0.093-inch, and stock widths from 5⅝ up to 18⅜ inches. All the coil weights and widths were, therefore, considerably below the maximum capacity of the slitting line itself, so the spread between maximum and minimum coils handled could have been even greater as far as the capacity of the slitting line is concerned. Only one of the jobs, No. 6, involved stock of a thickness equal to the rated capacity of the slitter.

Very Small Coils—Seven of the 14 jobs involved coils weighing less than 500 pounds, and only four jobs were on coils weighing more than 1000 pounds.

Cycle time for nine jobs involving the smallest coils in all cases was exceedingly low, ranging from a minimum of 3.54 up to 9.36 minutes each, while slitting time per cycle ranged from only 1.2 down to 0.2 minutes. As a result of the short cycle time, the tonnage production was so high that the average for all nine jobs of slitting the smallest coils was 4300 pounds per hour, or about 17 tons per day.

Table IV, although repeating data already given in time study, Table III, is introduced merely to facilitate a separate study of the nine jobs just cited, on coils weighing less than 1000 pounds each.

Several good reasons exist for using coils of such small weight and width. One of these may be that the stock is so thin that the edges are easily damaged. The heavier the coil, the greater will be the liability to damage of edges in handling.

While still in the slitting line, thin stock may be distorted or damaged while being pulled in between the separators. Liability to damage from this cause increases with the width of the original stock and the

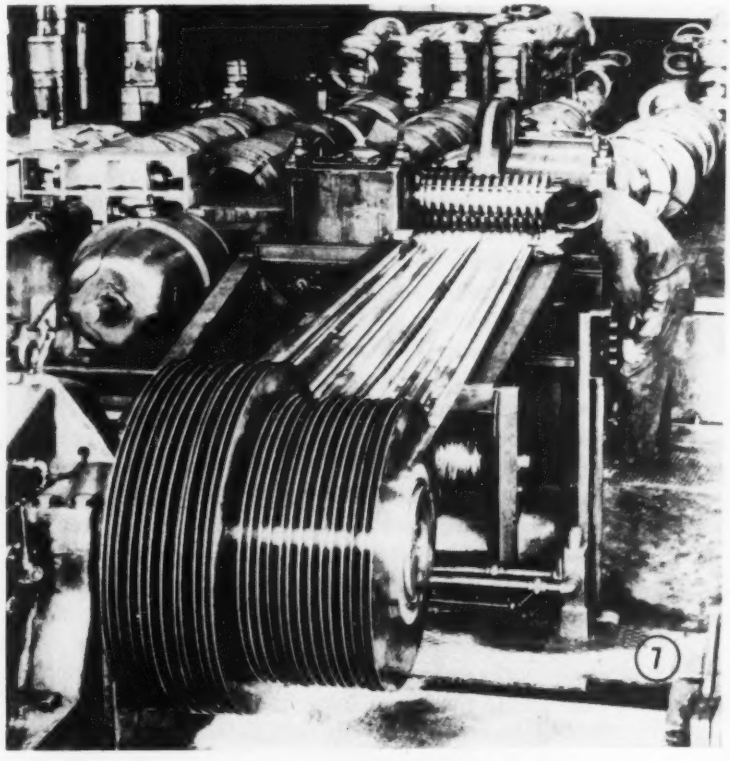
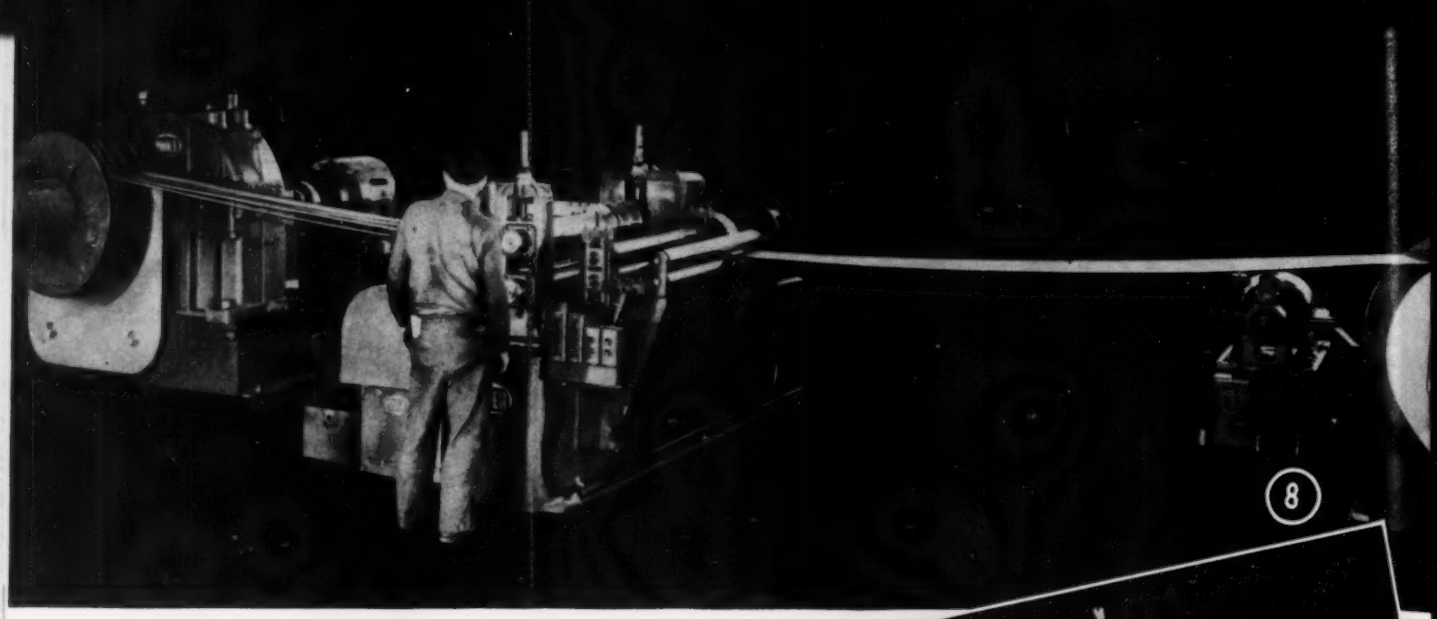
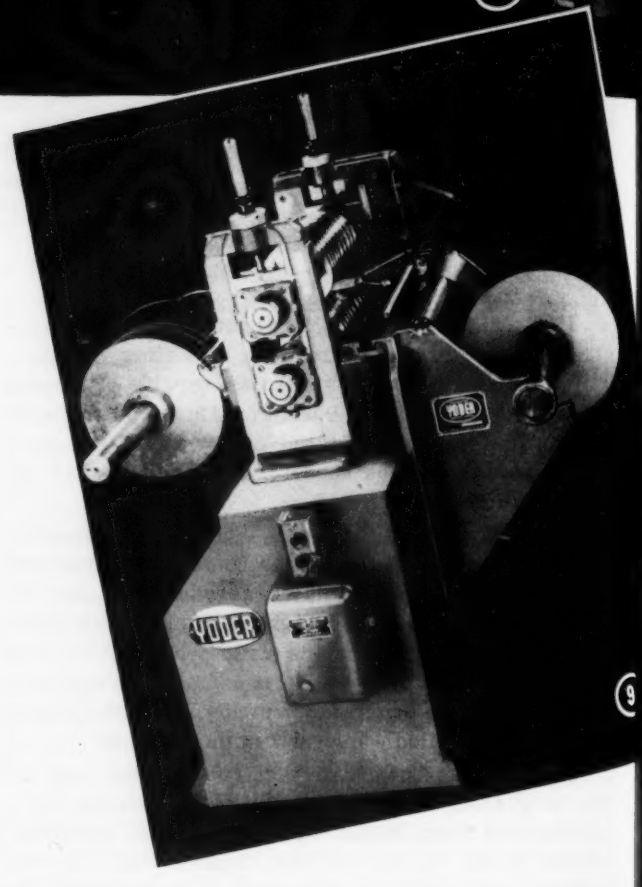


Fig. 7—Experienced operators often leave out the outside disk separator and clamping spider, saving time and making room on recoiler drum for more strands and separators





number of strands being cut therefrom. The explanation is that increased width and fanout cause the individual strands to be pulled in between the separators at a slight angle, thereby tending to squeeze the edges of the strands against the edges of the separators. Even when this does not happen, a tendency to camber is noted when the fanout is sufficiently great to cause an angular pull on the strands.

A different reason for using very small coils exists wherever the stock after slitting is to be used in machines requiring small coil diameters or short lengths, or if it is intended for ultimate use by roofers, tinners and other small consumers who, for one reason or another, prefer small, easily handled coils, or short lengths. Requirements of these groups in the aggregate account for a large tonnage constantly being slit from very small coils.

Coils From 1000 to 5000 Pounds—Turning to a consideration of the five jobs, Nos. 3, 5, 6, 9, and 11, involving coils weighing over 1000 pounds each, it will be seen that the cycle time is less than 22 minutes in all cases but one (No. 9). These jobs are shown in table V. Cycle time for Job No. 9 was 1 hour, 13.3 minutes, or over three times greater than for any of the four other jobs.

After deducting the slitting time on this job number, estimated at 15.5 minutes, the net handling time was still nearly 1 hour. This very long handling time may easily be accounted for partly by the care which has to be exercised in handling such very light gage stock to prevent damage to edges, and partly by use of protective paper between the surfaces of the original coils. This has to be removed in uncoiling, and new paper inserted between the strands in recoiling, in order to protect the surfaces from damage.

In spite of the extraordinary length of this cycle, it will be noted that the production was fair, namely 3350 pounds per hour, or nearly 13 tons per 8-hour day, with only two operators. This good showing was due to the use of fairly large coils, (4082 pounds). Since the stock was only 0.0135-inch thick, this meant a high footage per coil.

Slitting Flat Sheets—In a typical case, operating a standardized sheet slitter 36 inches wide for cut lengths, a 3-man crew in 8 hours handled 86,000 pounds, 0.038-inch thick by 38 inches wide, making seven cuts. This compares favorably with the production of coil slitters in similar cases, in spite of the fact that the standard sheet slitter speed normally is only 150 fpm, as against standard coil slitter average speeds ranging from a low of 300 fpm up, depending on coil diameter.

Difference in favor of sheet slitter performance is accounted for by the fact that slitter time is figured only from the time the stock is picked up by the crane for delivery on the entry table to the time of pickup from the exit table. Both of these operations are usually made in large lifts, often weighing 5 tons or more, so that the interruptions of slitter operation are usually few and far between.

The time, therefore, consists mainly of these two handling operations plus slitting time, which includes the lag between the passing of one sheet and the entry of the next one into the slitter. No threading

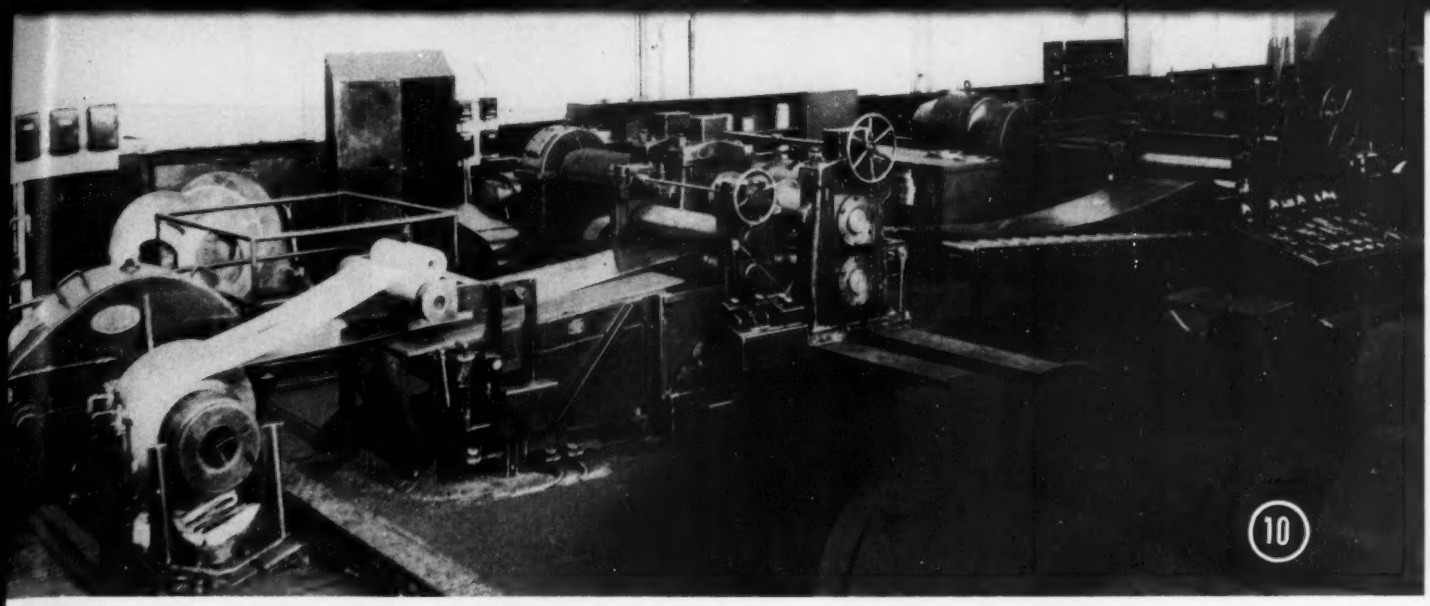
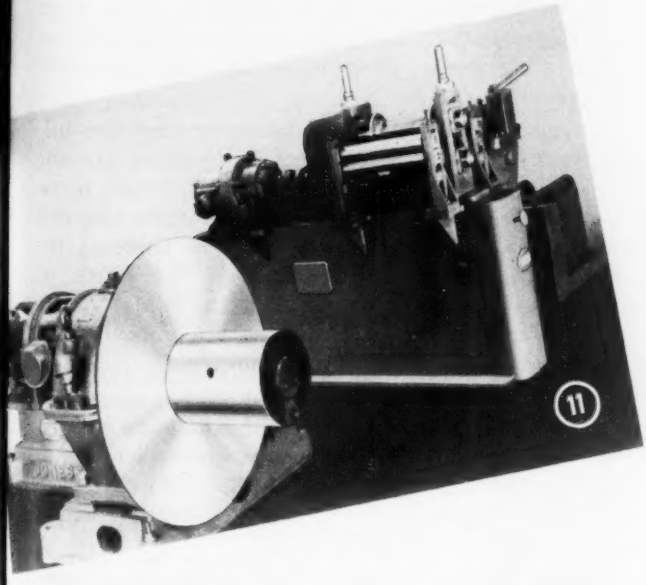


Fig. 8—Units in a slitting line for best results should be placed 15 feet center to center

Fig. 9—Completely self-contained small coil slitter with coil holder and recoiler; for coils up to 250 pounds and stock thicknesses up to 0.062-inch

Fig. 10—Mill slitting line for stainless steel, including auxiliary equipment for feeding paper between surfaces of slit strands as they are rewound on recoiler drum

Fig. 11—Small standard slitting line, consisting of coil box, slitter and pull-type recoiler, for stock up to 0.078-inch thick and 24 inches wide, coil weights up to about 3000 pounds



attaching, banding or stripping time is involved as in a coil slitting operation, and the initial investment is considerably smaller, as no uncoiler or recoiler is required.

Power Shears—The oldest and simplest power-driven shearing machine is the shear, variously known as a lever, alligator, guillotine, crocodile or squaring shear. Rotary gang slitters, on the other hand, are a relatively new development. The power shear, as is well known, can be used for cutting metal in any direction—longitudinally, crosswise and at any intermediate angle. It may also be fitted with special knives for cutting angles, tees, channels and other shapes, while the rotary gang slitter can cut only in one direction, longitudinally, parallel with the edges of the sheet or strip.

On the other hand, the shear can make only one stroke or cut at a time, with an accuracy which depends on the skill of the operator. The gang slitter will cut the mill-width stock continuously into 21 or more strips, at one time, with the highest degree of accuracy, both as to parallelism and width of strips, as accuracy here depends upon the machine rather than on the operator. While length of cut with a straight-bladed shear is limited by the depth of throat, or length of cutter blades, the sheet slitter will cut continuously any length without limit.

Scrap Disposal—Scrap from a coil slitting line, consisting of two narrow outside trim strips which are usually cut from the stock, may be collected and disposed of in a number of different ways. Each of these methods has its advantages and disadvantages; local conditions vary and operators have different ideas. What suits one may not suit another. The various methods are briefly discussed in the following:

Scrap choppers are available in various sizes installed at the exit side of the slitter. The choppers are mostly of the lawn mower type, with double revolving cutter blades which chop the trim strips into short pieces which drop into a removable container provided for this purpose. This unit provides a fairly automatic and by and large a satisfactory method of scrap disposal. It is especially advantageous where more or less heavy gage stock is being slit.

Scrap Ballers—These consist of a box enclosure in which is mounted a tapered solid arbor for rewinding the ribbons of trim scrap. From directly above, the weight of a heavy cast iron idle roller bears against the ball, for purposes of leveling and compacting it in rewinding. The ball when removed is sufficiently compact to require no baling or banding.

The baller is usually placed over to one side, between the slitter and recoiler, so as to be accessible to the operator in inserting and attaching the lead

TABLE III
TIME STUDY
14 SLITTING JOBS BY 2-MAN CREW ON OVER 1 MILLION POUNDS OF COILS WITH STANDARD SLITTING LINE 24 INCHES WIDE

Job No.	Original Stock Width Inches	Original Stock Thickness Inches	Strands Slit	Average Coils Weight Pounds	Average Coils Footage	Time in Minutes Complete Cycle	Time in Minutes Slitting Only	Approx. Slitting Speed	Per Cent* Slitting to Cycle	Production Pounds per Hour
1	11 3/16	.0469	4	431	241	9.36	1.0	250	10.7	2800
2	10 1/2	.035	4	365	292	5.28	1.2	250	22.7	4165
3	16 1/8	.062	1	3445	1013	18.54	2.9	350	15.6	11135
4	9 3/8	.035	5	340	305	5.10	1.2	250	24	4000
5	14 3/4	.062	2	1945	626	13.86	2.1	300	15.1	8423
6	11 1/2	.093	3	1030	283	16.74	1.2	250	7.2	3683
7	10 7/16	.076	7	200	70.7	7.86	.3	250	4	1470
8	12	.074	5	681	225	9.18	.9	250	9.8	4450
9	17	.0135	1	4082	5442	73.13	15.5	350	21.2	3350
10	16 3/4	.035	3	416	203	5.86	.8	250	13.6	4245
11	8	.083	1	2560	1138	21.24	1.9	600	8.9	7215
12	5 5/8	.080	9	80	52	7.62	.2	200	2.62	629
13	13 1/16	.070	4	752	227	9.12	.9	250	10	4937
14	18 3/8	.037	4	369	159	3.54	.6	250	17	6219

* Ratio of slitting time alone to complete cycle time. Complete cycle time implies handling one coil through slitter, placing one band around each of slit coils and unloading to fork truck.

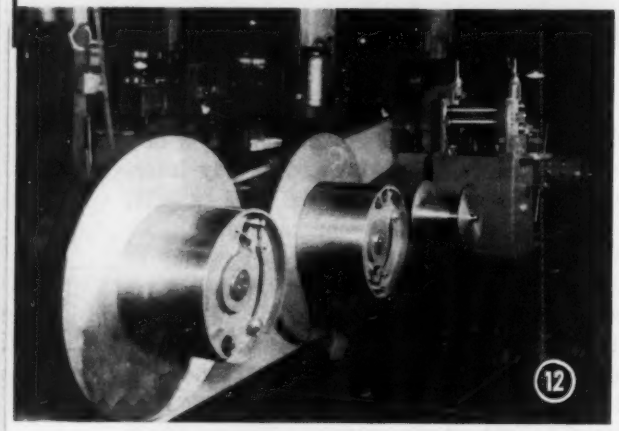


Fig. 12—Tandem recoilers may be used to eliminate fanout and to divide the footage in the original coil into coils of smaller diameter

TABLE IV
COILS WEIGHING LESS THAN 1000 POUNDS EACH

Job No.	Strands Cut	Original Stock Width Inches	Original Stock Thickness Inches	Coil Weight Pounds	Cycle Time Minutes	Slitting Time Minutes	Production Pounds per Hour
1	4	11 3/16	.0469	431	9.36	1	2800
2	4	10 1/2	.035	365	5.28	1.2	4165
4	5	9 3/8	.035	340	5.10	1.2	4000
7	7	10 7/16	.076	200	7.86	.3	4450
8	5	12	.074	681	9.18	.9	4450
10	3	16 3/4	.035	416	5.86	.8	4245
12	9	5 5/8	.080	80	7.62	.2	629
13	4	13 1/16	.070	752	9.12	.9	4937
14	4	18 3/8	.037	369	3.54	.6	6219

TABLE V
FIVE SLITTING JOBS ON COILS WEIGHING OVER 1000 POUNDS

Job No.	Number Strands	Original Stock Width Inches	Original Stock Thickness Inches	Coil Weight Pounds	Cycle Time Minutes	Slitting Time Minutes	Production Pounds per Hour
3	1	16 1/8	.062	3445	18.54	2.9	11135
5	2	14 3/4	.062	1945	13.86	2.1	8423
6	3	11 1/2	.093	1030	16.74	1.2	3683
9	1	17	.0135	4082	73.13	15.5	3350
11	1	8	.083	2650	21.24	1.9	7215

ends from each new coil. Feeding the tangle of scrap into the box enclosure requires constant attention.

Rewinding on Recoiler—The trim strips can be rewound simultaneously with the usable strands, and in just the same manner, by merely mounting an extra separator on each side of the recoiler drum and attaching thereto the lead ends from each new coil before commencing to slit. The two narrow strips form neat, compact coils, but the attachment of the strands and radial banding before stripping consumes considerable time. It is also difficult to keep such narrow coils from telescoping unless carefully handled. This method is, therefore, seldom employed unless the narrow strands can be utilized for some purpose other than melting scrap.

Rewinding on Separate Reel—A separate rewinding reel may be employed, incorporating a collapsible drum and a slip clutch drive. The reel may also be equipped with a simple levelwinding device.

Where space permits, operators sometimes install between the slitter and recoiler a low fence designed to arrest and hold the ribbons of edge trim as they come out of the slitter and are being trailed along towards the recoiler. A baling press is usually employed for compacting the mass after removal from the fence enclosure.

Distance Between Units in Slitting Line—Mill width stock has more or less camber which is not noticeable in the coil but would become visible if the strip or sheet were pulled out and laid out on a floor, free and unobstructed. The presence of camber would then be evidenced by any deviation of the edges from the straight line. Camber is due to uneven wear of rolls, causing uneven pressure on the strip, especially in cold rolling.

In a slitting line, if the distance between the uncoiler and the slitter is too short, any camber present has a tendency to cause the edges to be folded in as the metal is being pulled into and through between the side guides on the entry table. This tendency increases inversely with the thickness and width of stock, being especially pronounced in the lighter gages. The shorter the distance between the uncoiler and slitter, the greater will be the tendency to folding-in of edges.

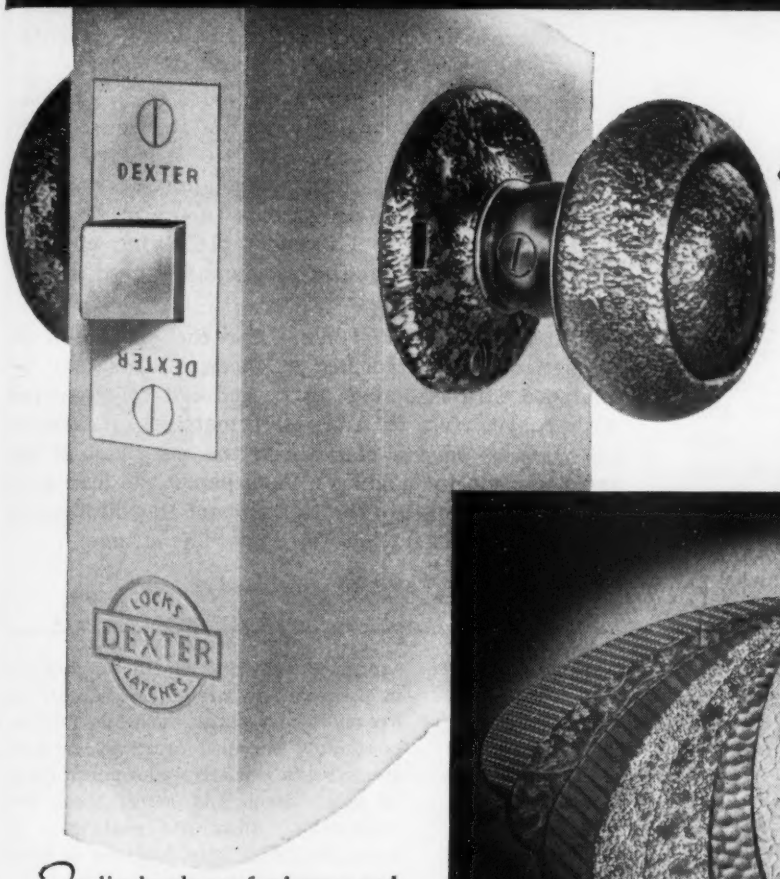
These are matters of common experience. It is therefore considered good economy, even where space is at a premium, to place the uncoiler and slitter 15 feet or more apart, center to center, especially where more or less thin stock is to be slit.

Slitting Narrow Strands—The slitting of a large number of narrow strands presents difficulties which call for special care in making the cutter setups, and sometimes also special equipment, such as tandem recoilers, rewinding reels and other accessories. With standard slitters, the number of cuts is normally limited to 21. Beyond this number, the fanout becomes so great that special provisions must be made to minimize or eliminate it.

If coils of a width equal to width of the slitter are used, a recoiler with a longer drum must be provided

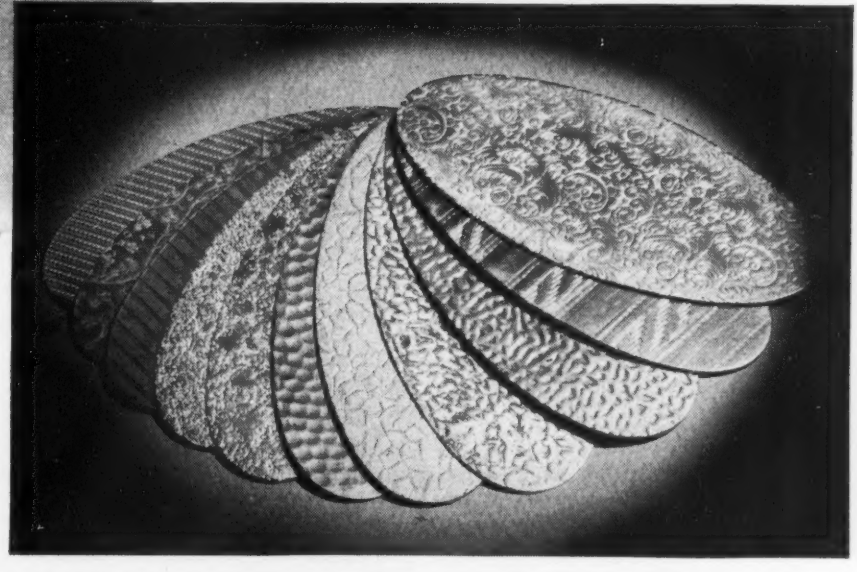
REVERE EMBOSSED METAL ADDS TO BEAUTY

of Solid Brass Hardware



A Dexter set made by National Brass Company, Grand Rapids, Michigan; in the lifetime beauty of solid brass. Knob is fabricated from a Revere Embossed Pattern.

Inset, some embossed patterns produced by Revere.



Quality hardware for homes and commercial buildings always is solid brass or bronze. There are no substitutes for these solid, ever-lasting metals that cannot rust, whose beauty is not skin deep but goes all the way through. Thus time and use improve the finish instead of spoiling it. That is why good buildings everywhere feature solid brass and bronze for such items as locksets, door knobs, butts, latches, hangers, hooks, and similar parts that should speak of quality as long as the building stands.

Take the National Brass Company. This well-known hardware manufacturer features solid brass 100%, knowing that any architect, builder or home owner recognizes the worth of enduring high quality. Their line is trademarked "Dexter", and one of its feature items is trim in etched finish. Actually these items use solid Revere Embossed Brass, which is furnished in a variety of standard and special patterns, ready for fabrication into articles of exceptional attractiveness, not only hardware, but also a wide range of products such as compacts, clock dials, cigarette cases, jewelry. National Brass states that Revere Embossed Brass not only produces a really handsome line, but one whose beauty increases with age, since use brightens the high-lighted raised surfaces, while the shadows in the depressions provide an effective contrast. Thus this fine Revere Metal assures lasting satisfaction to the home owner, and enhances the reputation of the architect, contractor, and builder. . . . For true quality, high sales appeal, and enduring service, wise manufacturers use solid durable metals such as copper, brass, bronze, nickel silver provided by Revere not only in Embossed Metal but in plain sheet and strip and in bar, rod, extruded shapes.

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in order to make it possible to make more than 21 cuts, allowing for the additional fanout. A recoiler drum one size longer than that otherwise necessary is then chosen if available in a standard size, otherwise a special length may have to be used.

Minimizing Fanout — When a large number of strands have to be slit, it is advisable to distribute the fanout equally to the left and right of the center line, thereby dividing it in two. To this end, in installing the recoiler, it should be set back about 1½-inch from the slitter and uncoiler. This will provide space for the fanout to the right of center when making any number of cuts up to 21. It also allows for necessary clearance between the stripper plate and the first coil separator, to avoid frictional contact when rewinding.

Banding Difficulties—Narrow strands present banding difficulties due to the tendency of the narrow coils to get out of alignment and telescope. Unless the coils are very small, circumferential banding is useless, as it will not keep the coils from telescoping. Unless rewinding spools are used, radial banding must then be done before removing the individual coils from the recoiler drum. This takes considerable time, greatly reducing the daily output. Where large quantities of narrow strands are to be cut, rewinding on spools or reels is therefore usually resorted to.

Tandem Recoilers—Where the strands are either very narrow, or the total number of strands very great, or both, a tandem recoiler may be used. The slit strands are alternately attached to the two recoiler drums, both of which are placed in line with the uncoiler and slitter, one drum above and/or beyond the other. Width of each drum is equal to width of the slitter. By the alternate attachment of strands, fanout can be entirely eliminated, as ample extra space is then available between the strands for the thickness of separators or reel flanges.

Each of the drums may be equipped with a slip clutch to permit equalizing the tension on the strands, if one coil tends to build up faster than the other. Unequal coil build-up may be caused by variations in stock thickness. Tandem recoilers are also used to advantage in slitting a few wide strands, and even when making only two edge-trim cuts. The special purpose then is to reduce the length or diameter of the coils, to meet the demand for smaller, lighter coils than are produced in the rolling mill.

By using two recoilers for this purpose, the drums can be loaded alternately; that is, while the slit strands are cut and the individual coils are being banded and stripped from one drum, another operator can attach the following strands to the other drum and start slitting, at a considerable saving of time. In this application, tandem recoilers are used mainly by strip and sheet mills.

Protecting Fine Finishes — For the protection of painted or highly finished surfaces, slitters may be equipped with feed rolls, entry and exit rolls covered with rubber, felt or other soft material. Likewise, payout reels may be placed near the entry side of the recoiler drum for holding rolls of paper, the lead ends of which are taped to the lead ends of the slit strands after these are attached to the recoiler drums.

(To be concluded)

Cuts Valve Servicing Costs

VAST savings in maintenance and servicing costs of pressurized lubricated valves, without one cent being invested for special equipment, are expected from use of a new pressurized plug valve lubricant developed in the Nordstrom laboratory of Rockwell Mfg. Co., Oakland, Calif.

Lubrication and service costs of such valves might be cut from 10 to as much as 90 per cent while valves are maintained at higher peak of efficiency by the product which seemingly establishes a hydraulic law unto itself.

Defying physics laws (that water and oil are incompressible within a confined space for all practical purposes) the lubricant actually may be compressed to create an "energized" condition that causes it to be fed automatically to seal seating surfaces and fill voids within the valve, according to the manufacturer. It retains its energy for multiple valve turnings and may be re-energized when pressure finally subsides. This is done by adding more of the same substance to refill the valve chambers, or by turning the lubricating screw.

Although primarily perfected for pressurized plug valves, the product holds possibilities for applications in other fields. Field tests indicate successful performance under most conditions in a temperature range to 250° F. Applications to lines of higher temperatures may become available after completion of further tests.

Performance of the product in a closed reservoir may be compared to action of a tank of compressed air which, because of its compression, stores enough energy within itself to permit intermittent or continuous work to be done as the air is bled off. The development continues to exert pressure to fill lubrication voids until the confined pressure drops to a minimum of 50 pounds. Full automatic valve lubrication is restored by inserting more of the material in stick form or by a high pressure grease gun.

New and Revised SAE Specs

FOUR new specifications and 9 revisions of former specifications of aeronautical material may be obtained from Society of Automotive Engineers Inc., New York. Specifications published include those for cadmium and zinc plating, hydraulic fluid, synthetic rubber, aluminum alloy sheet and plate, sand and permanent mold magnesium alloy castings, steel sheets and strip, aluminum coated steel sheet and strip, steel and magnesium alloy die castings. A complete set of specifications in loose leaf form is available at $1.15.

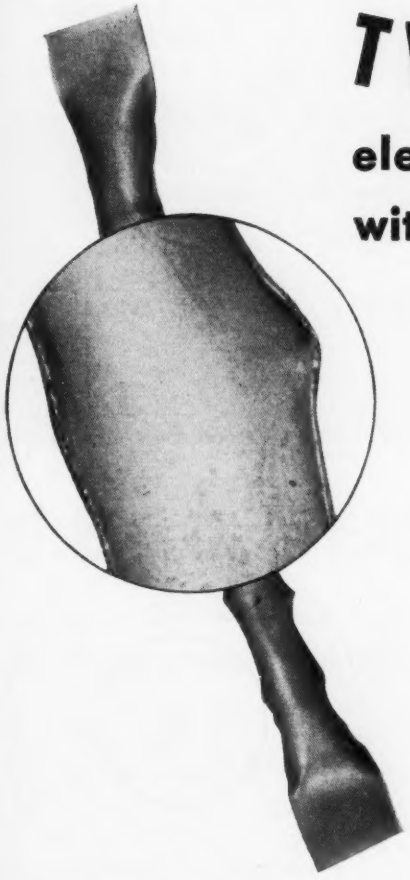
Plastic Knob Uses Fasteners

SAVINGS up to 50 per cent in assembly of plastic knobs were realized with the application of push-on type, Speed Nut fasteners, according to Tinnerman Products Inc., Cleveland. Said to be applicable in most assemblies requiring the attachment of a plastic knob to a round shaft, method was developed by the Lovell Mfg. Co., Perry Plastics Co. and Tinnerman for washing machine wringer knobs.

The Lovell washing machine knob was designed so that it was molded in two parts, the cap of the knob containing a cylindrical cavity inside which the round fastener is inserted. The two knob sections are cemented together, holding the fastener securely in position. Completed knob is then pushed on the shaft for final assembly and held in place by the fastener.

TWIST TEST PROVES

electro zinc coated THINSTEEL withstands toughest fabricating operations



● The upper photograph shows how a ½" x 4½" piece of .0135" Electro Zinc Coated CMP Thinsteel was twisted tight and completely reverse twisted fifteen times. Below is shown the test sample straightened out after the fifteenth reverse twist.

The microscopic view shows a section after this gruelling test. Note that the tough, ductile, high-purity zinc coating still adheres tightly to the steel, its smooth, lustrous surface unmarred by flaking, peeling or cracking.

Here is proof that, whatever your fabricating operations, Electro Zinc Coated Thinsteel will come through unharmed.

If your product needs the corrosion resistance of a superior zinc coating — or if you can make it more attractive to the market by using zinc-coated steel, it will pay you to look further into Electro Zinc Coated CMP Thinsteel.

We'll gladly send you a sample to make your own tests.

THINSTEEL facts

Extra-Long Coils
— less downtime

Extremely Close Tolerances
— more parts per ton

Wide Range of Physicals and Analyses
— tailored to your needs

Gauges as Thin as .001"
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HARD-FACING IMPROVES PERFORMANCE

. . . and reduces maintenance costs of ball mill shearing machine parts

PERFORMANCE of hot steel shearing equipment in one large steel plant is reported to have shown enormous improvement since the introduction of hard-facing as standard practice on ball mill shear blades and header forming dies. Before the use of Stellite alloy, produced by Haynes Stellite Co., a unit of Union Carbide & Carbon Corp., New York, one set of shear blades produced a maximum of 10 tons of smaller size steel balls (2 to 3 inches in diameter) and no more than 30 tons of larger balls (ranging from 3½ to 5 inches in diameter).

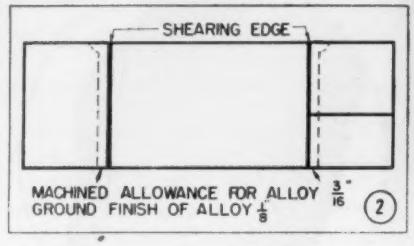
A set of blades hard-faced with the alloy will produce as much as 150 tons of the smaller balls. Ninety tons of larger balls have been produced with the original set of hard-faced blades. Present condition of this set of blades indicates that a tonnage as high as 200 will be obtained.

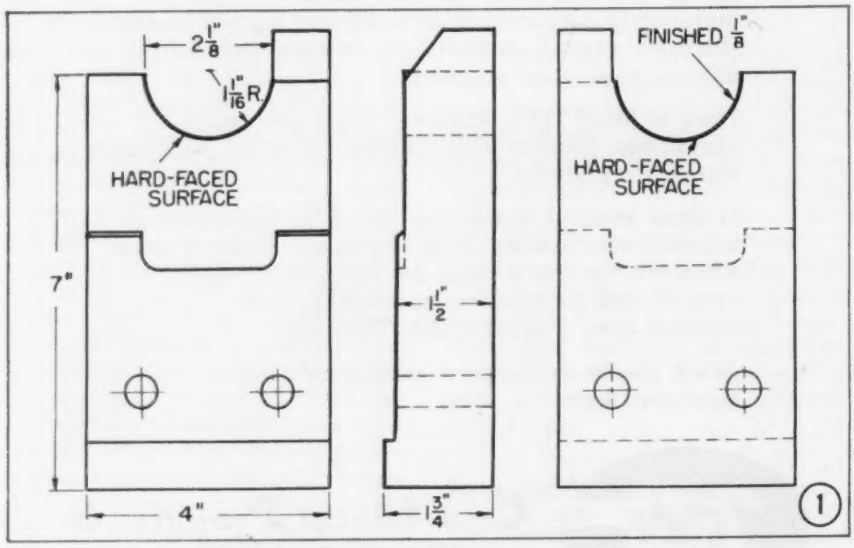
First hard-faced, header forming die has produced 75,000 balls to date and is still in very good condition, while the greatest number of balls produced by the steel forming die was 31,000.

Two types of balls have been produced since this operation was introduced. Some were 0.70 to 0.80 per cent carbon steel (similar to rail steel) and some were chrome steel. Chrome steel is now used exclusively and is considered superior to the straight high-carbon steel. Its composition varies from 0.50 per cent carbon and 0.85 per cent chromium for the smallest ball (2 inches) to 0.55 per cent carbon and 0.55 per cent chromium for the largest ball (5 inches).

Balls from 2 to 3 inches in diameter are made on one machine and the 3½ to 5-inch balls are made on another. The largest machine is an alligator shear; the smaller one has specially designed blades. Fig. 1 shows the front, back and edge of a shear blade. The heavy black lines on the radius indicate the alloy deposit ground to ⅛-inch depth. Fig. 2 is an end view of the shear blade illustrated in Fig. 1. Dotted lines show the method of machining before application of the hard facing alloy. Header forming die is shown in Fig. 3. This die is used for rough forming the heavy balls, immediately after shearing.

Stellite alloy No. 6 has been found to be the most suitable grade for this work on all the parts encountered. It is applied to the parts to a depth of $\frac{5}{16}$-inch, with approximately ⅛-inch left after finish grinding. Comparatively small quantities of the alloy rod are required for each part. The largest amount—about 5 pounds—is needed for the largest alligator shear blades. Because the application is new, no detailed cost figures are available. However, the superintendent of the ball mill where this work is done has estimated that the average saving will be about $500.00 per month.





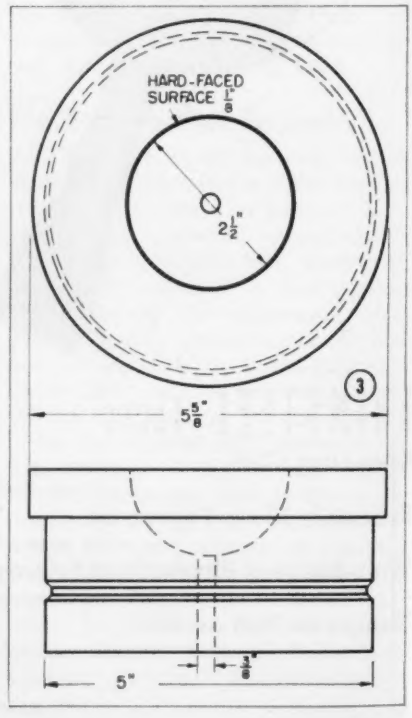
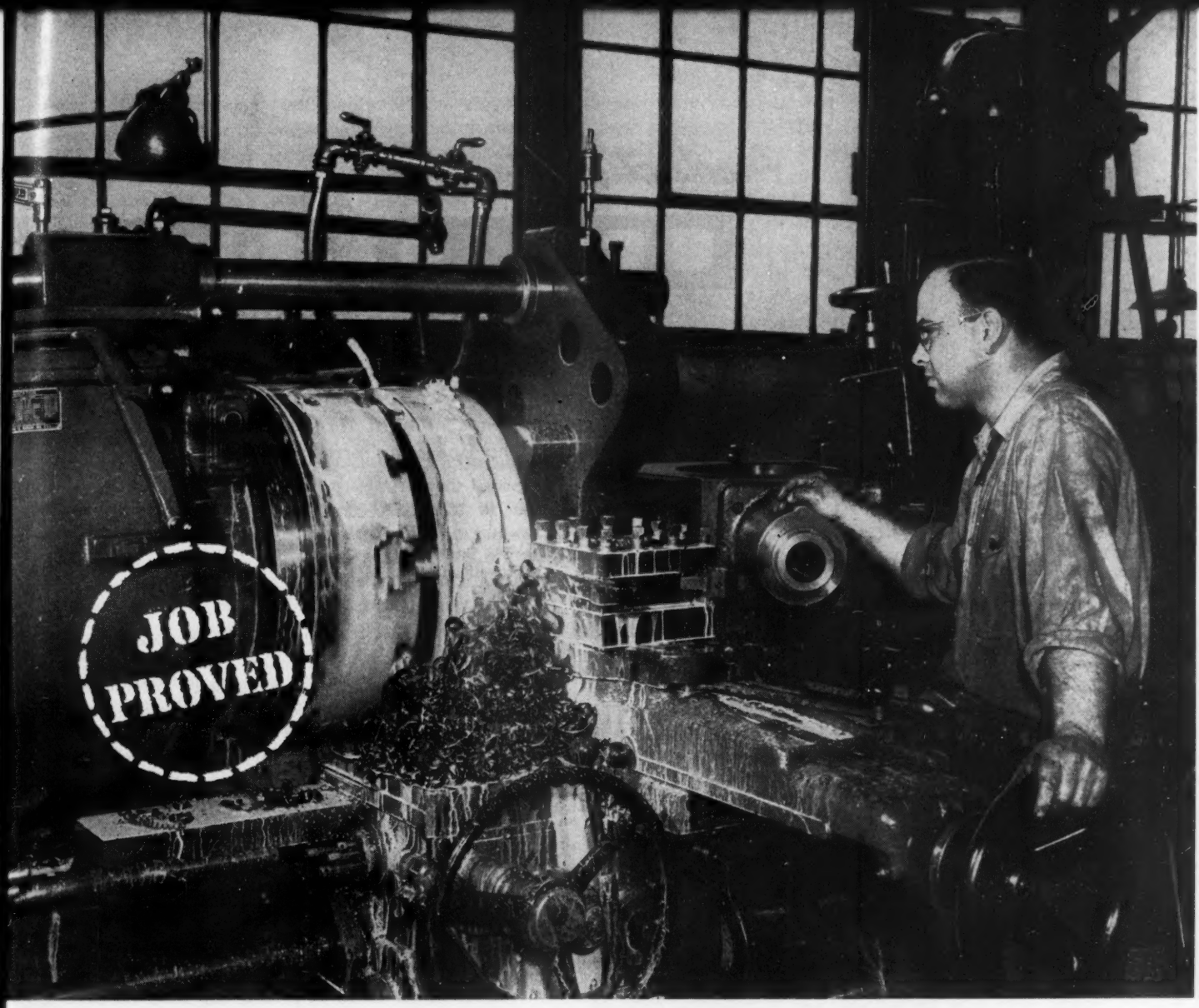


Fig. 1—Drawing of Acme size "C" header shear blade

Fig. 2—Plan view of header shear blade, showing machined and hard-faced areas

Fig. 3—Top and side views of ball mill shear header forming die



S.E.C.O. BEATS COSTLIER CUTTING OIL

Competitive Product Fails to Match Fine Record of Sunoco Emulsifying Cutting Oil in Cost or Performance

For 27 years a metalworking shop used Sunoco Emulsifying Cutting Oil with complete satisfaction on difficult operations. The following is a typical example:

Machine: Gisholt turret lathe, model 4L.
Part: 20" press mold shell 22⅝" O.D. x 6" wide x 20½" I.D.
Operation: Turning, boring rough forgings.
Materials: 40-50 carbon steel.
Tools: Firthite carbide tools.
Feed: .012 at 31 rpm.
Cut: ½" to ¾" on O.D. and boring.

Tool life was excellent. Machines stayed clean. High production, with minimum scrap, was the rule year in and year out.

Two years ago the shop was persuaded to try a competitive oil on the above operation. Test results showed that the competitive oil, costing three times as much, lacked stability. Performance was far inferior to that of Sunoco Emulsifying Cutting Oil in regard to tool life and quality of finish. The company was quickly convinced that its original choice had been sound.

In all machine shop operations, on both ferrous and nonferrous metals, you'll find Sunoco Emulsifying Cutting Oil and Sunicut* straight cutting oils of real assistance. They help maintain production schedules, lengthen tool life, and keep operating costs down. For a free Sun cutting oil recommendation card, write Dept. S-10.

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Production of PIG IRON

In this concluding installment, the author describes the cast house, charging of raw materials, chemistry of furnace reactions and discusses modern trends in blast furnace construction and operating practice

By B. M. STUBBLEFIELD
Manager, Chicago District
Youngstown Sheet and Tube Co.
East Chicago, Ind.

PART IV

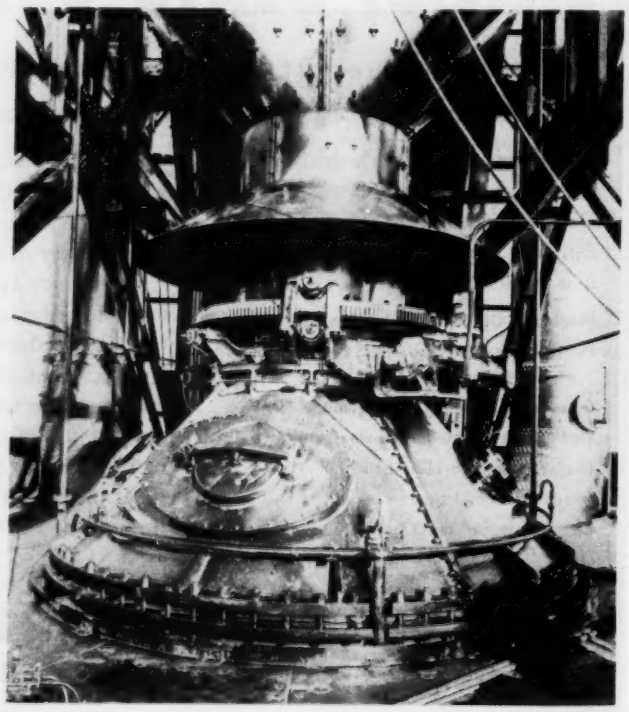
LARGE expansive sand beds formerly used for pig iron casting are a very rare sight today. The vast majority of blast furnaces now operate on a hot metal handling basis. However, for safety precautions and for special purposes, practically every blast furnace shop has a pig casting machine which is an endless chain of pig molds that are water cooled by sprays.

The cast house of today is essentially a small roof-covered platform which is traversed by cast iron runners for carrying the iron and slag to large containers mounted on railroad trucks. All hot metal cars are refractory-lined steel vessels. Originally, they were relatively small open-top ladles mounted on trunnions. In addition to increased capacity, many new hot metal cars are torpedo-shaped mixer-type cars of 200-ton capacity in which hot metal can be kept for better than 24 hours without appreciable skulling.

Slag disposal methods vary in different plants. In general, however, the slag is run into thimbles, cast iron or steel vessels mounted on railroad trucks which carry it to the dumping ground. Capacity of the average thimble is about 300 cu ft. Since no lining is used, these castings are coated with a lime-water wash to prevent slag sticking. Thimbles are mounted on trunnions and are self dumping, generally steam or air operated. At other plants, the slag may be run into open pits called hot slag pits, where it is allowed to cool, or may be run off into a slag granulating pit containing water.

For optimum gas distribution in the stack it is generally believed that the best charging procedure would be to place layers of even thickness of the various solid materials in a definite order on the top of the furnace burden. Particle size of the material would be closely controlled so that all coarse material would be in one series of layers and the fine material in another. Thickness of these layers of the different materials would vary, bearing a definite relationship to each other to produce the desired iron analysis. By close control of particle size and by the automatic top charging mechanism of the double bell hopper and distributor arrangement an approach to this ideal condition is attempted. By rotation of the small bell between skip loads, materials are distributed evenly around the large bell's circumference. However, because of differences in particle size and weight, it is impossible to place the solid materials evenly across the entire furnace cross-section. As larger and heavier particles tend to roll further than smaller and lighter particles, this results in a raised ring outside the periphery of the large bell with a center and an outer valley. This effect can be regulated to some extent by close control of particle size and by design and operation of the large bell with relation to the ratio of the large bell diameter to stockline diameter, speed and amount of

Fig. 19—View taken on furnace top platform showing gas seal and McKee revolving distributor above which is seen the bottom section of the receiving hopper



travel of the large bell, and height of the stockline.

In addition to the regulation and method of charging, the burden must be watched with respect to chemical composition in order to obtain iron of the desired analysis. This chemical calculation of the charge requires an exact knowledge of the chemical and physical properties of all available solid raw materials. In addition, furnace operators must have a background of experience in producing a similar iron in a similar furnace with the same or equivalent raw materials in order that basic assumptions of the quantitative relationships between various raw materials may be made to determine required proportions of each. The filling cycle, which consists of a series of openings of the large bell, each of which is composed of a definite, although not identical, schedule of skip bucket loads, is first determined. Amount of coke required is computed, and the weight of iron is calculated in proportion to the amount of coke. From these initial estimates, exact proportioning of the various ores, flux and fuel is derived by a lengthy series of chemical calculations in which the raw material chemical composition is balanced to produce the desired iron analysis and a satisfactory slag.

In considering the essentials of this process, it must be remembered that fuel, ore and flux are charged into the furnace top and heated air is blown in at the bottom. In addition the pig iron and slag are discharged at the bottom and gas, carrying a considerable amount of solids is blown out at the top. Temperature of the solid charge varies unevenly throughout the furnace both in the horizontal and vertical planes. These variations in temperature, which range from 400° F at the top to 3000° F at the tuyeres, and also variations in ununiform stock distribution, due to particle size and method of charging, result in inconsistent and uneven gas distribution and flow of material in the stack. Thus furnace smelting operations become a very complicated series of physical and chemical reactions occurring at indefinite levels in the stack.

An excess of fuel is always present in a blast furnace. This fuel, which is actually solid carbon, serves two main purposes which are to provide heat and remove oxygen from the iron ore. To create the necessary heat, some of the carbon combines with oxygen from the air blast in the vicinity of the tuyeres. Heat from the combustion plus heat induced by the hot blast melts both the iron and slag and provides the necessary energy to promote the physical and chemical reactions in the furnace.

Although carbon may directly reduce some ore in the higher temperature regions of the furnace, the chief reducing agent is carbon monoxide gas. This ore reduction occurs at various degrees of intensity and completion throughout the stack. Although actual chemical reactions involved are numerous and very complex, the fundamental equations are as follows:

(1) $O_2+2C=CO_2$
(2) $CO_2+C=2CO$
(3) $Fe_2O_3+3CO=2F+3CO_2$

The first equation expresses the reaction which supplies the necessary heat. However since this combustion is carried on in the presence of an excess of carbon, the CO_2 is probably immediately converted to CO. This carbon monoxide then reduces the iron ore to iron. This step is illustrated in equation three, although the actual chemical reaction is unquestionably much more complicated. Since this reaction is reversible—(it will stop and proceed in the opposite direction if an excess of CO_2 is present)— excess fuel or carbon must always be available to convert the CO_2 back to CO as shown in equation two.

Pure iron will not melt at the blast furnace temperature of approximately 3000° F. However, as the

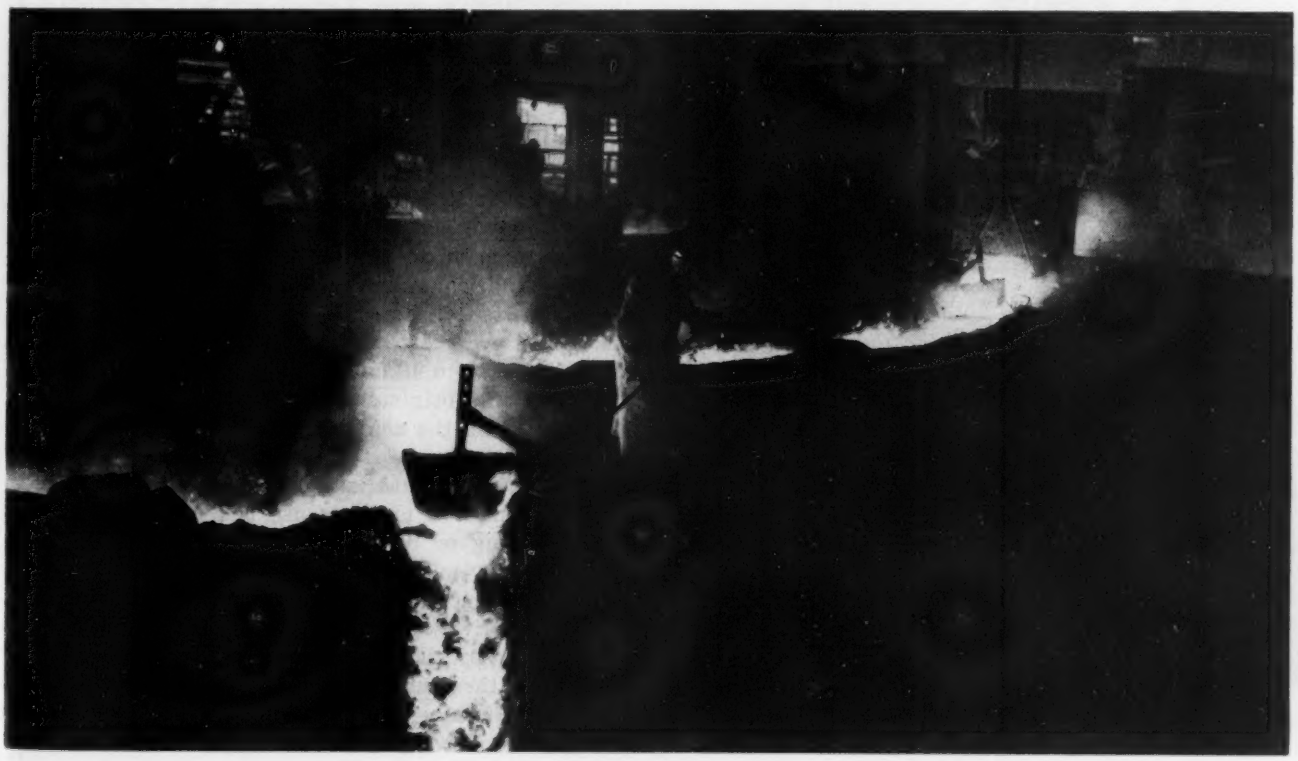


Fig. 20—View in cast house as pig iron is being delivered from furnace

Fig. 21—Thickener used for separating flue dust from the gas washer discharge water

iron is reduced to sponge iron and descends in the furnace, it picks up carbon as an alloying element which lowers the iron's melting point. In the carbon range of pig iron around 3.5 to 4.5 per cent, the iron is fluid at 2500° F which temperature is readily maintained in the furnace hearth.

Iron can hold up to a maximum of 6.7 per cent carbon. Some elements such as silicon decrease this capacity for carbon. As molten iron collects in the hearth, some carbon is precipitated out of the bath by indirect chemical action. This graphite covers the hearth lining and forms a protective coating several inches thick. This decreases lining wear by eliminating the scouring action of the molten iron and slag and thus increases possible furnace life.

The flux performs two important functions which are to fuse the gangue of the ore, and to remove the sulphur from the iron. This gangue which is acid in character, mainly silica and alumina, will not melt at temperatures present in the furnace. If a basic flux were not used, fusible iron compounds would

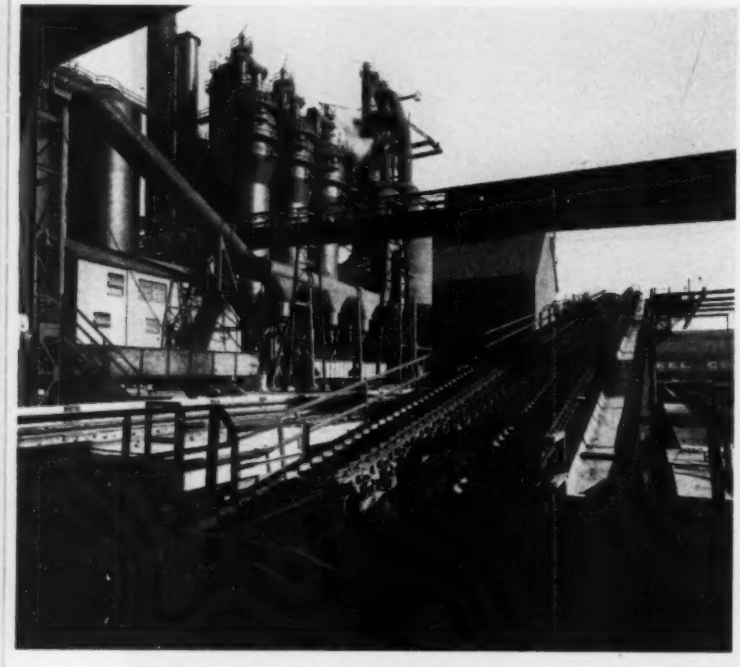


Fig. 22—View from pouring end of pig casting machine

TABLE VII
PIG IRON CHEMICAL COMPOSITION

Use	AISI Designation	Composition % Si	S Max.	P	Mn
Basic	B & Bs	1.00 max/1.50	0.05	0.400 max/0.900	1.01/2.00
Bessemer	Bes	1.00/3.00	0.05	0.076/0.100	1.00 max/1.25
Malleable	M	0.75/3.50	0.05	0.101/0.300	0.50/1.25
Foundry	Fl, Fh, Fs	1.75 max/3.50	0.05	0.300/0.900	0.50/1.25

be formed which would result in a tremendous loss in iron. However, the acid gangue has a greater affinity for the basic flux than iron, and a fluid slag is formed. In addition, this slag must have a greater affinity for sulphur than for iron as sulphur is undesirable in the iron. As the slag rests on the molten iron, it extracts sulphur from the iron as it passes through the slag. This sulphur removal requires a fluid and basic slag.

Although specific levels or various reactions cannot be definitely delineated, the furnace can be divided into approximate zones of reaction. These zones are not constant, fixed areas nor are the reactions mentioned confined to a fixed area, but vary as the furnace heat balance is altered by various operating conditions.

In the top 6 to 10 feet of the charge, where the temperature varies from 350 to 600° F, (zone of dehydration), the combined moisture is driven off and ore reduction commences.

In the approximate middle third of the stack, where the temperature range varies from 600 to 1650° F (zone of upper reduction), practically all reduction of the ore with either carbon or carbon monoxide is started, and a large part is carried through to completion. Calcination of the stone also occurs in this region.

In the lower third of the stack with a temperature range of 1650 to 2200° F (zone of lower reduction), additional reduction of the ore takes place. In addition, reduction of manganese oxide and slag formation is begun.

In the area from the bottom of the hearth to the top of the bosh (zone of fusion), all final reduction of the oxides is completed. The iron absorbs carbon to form carbides, iron and slag are liquefied, and the slag takes up sulphur from the iron.

In the area in the immediate vicinity of the tuyeres extending in for about 3 feet (zone of combustion), the carbon is burned to carbon dioxide and reduced to carbon monoxide by the excess of solid carbon.

By definition, pig iron is the metal product from the reduction of iron ore in the blast furnace which is tapped every 4 to 6 hours after it has been in full blast from 30 to 40 hours. For ease of handling, molten iron was originally cast into small shapes in a sand bed, and the name of pig iron was derived from the arrangement of the runners and molds in the sand bed. Hot metal is pig iron which is kept in a molten condition until its use is required either for steel making or direct casting into finished shapes.

Chemically pure iron, the primary element of blast furnace product, is a soft, ductile and malleable metal with a relatively low tensile strength. The impurities ordinarily associated with the iron in the blast furnace alter these properties considerably. As cast from the blast furnace, hot metal contains, in addition to iron, the following amount of other elements: 3.50

WARD TELEVISION ANTENNAS MADE
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EASIER TO INSTALL with
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J&L STEEL
The vertical mast and cross-arms of the Ward "Minute Man" antenna are made of J&L PERMA-TUBE. It takes just 60 seconds to remove the preassembled antenna from its box and swing all arms into position as shown here. PERMA-TUBE antennas combine strength, rigidity and rust-resistance—give longer *trouble-free* service—and better television reception.

PERMA-TUBE may be used for many applications where strength, rigidity, rust-resistance, and attractive appearance are necessary.

By using the new exclusive rust-resisting J&L PERMA-TUBE for the vertical mast and cross-arms in the "Minute-Man" series of television antennas, Ward Products Corporation, Division of the Gabriel Company, Cleveland, Ohio, builds-in the following advantages:

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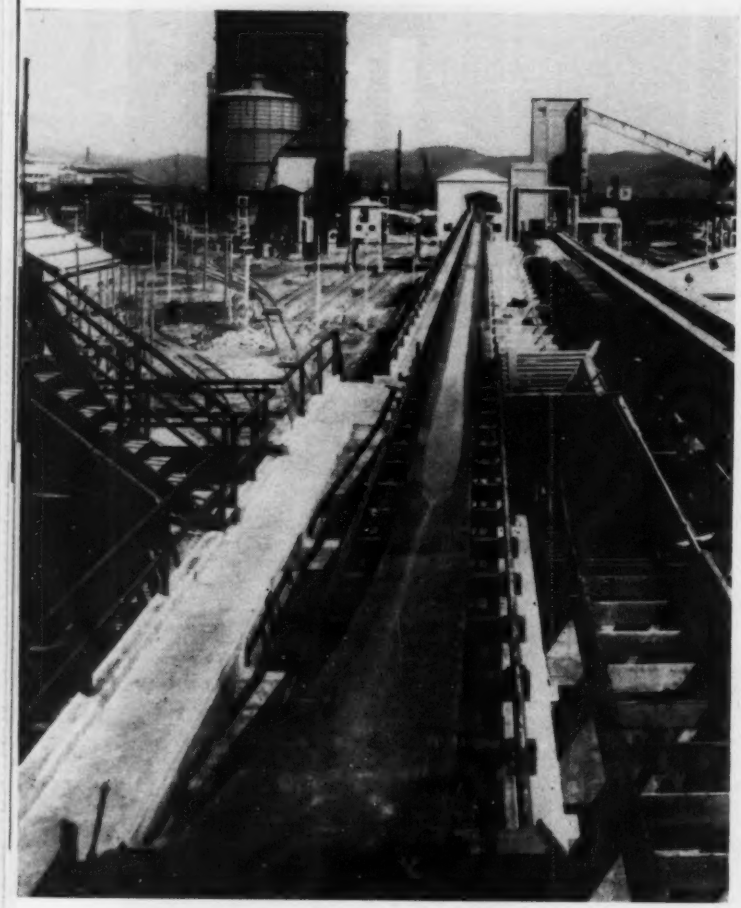


Fig. 23—Coke conveyor belt which transports coke from the ovens to the blast furnace stock house

to 4.50 per cent carbon, 0.50 to 5.00 per cent silicon, 0.50 to 2.00 per cent manganese, 0.035 to 0.90 per cent phosphorus and less than 0.05 per cent sulphur.

Carbon, which occurs in pig iron in two forms, dissolves readily in molten iron. Upon cooling, carbon tends to form free carbon graphite flakes, which form planes of weakness in the iron. Various factors, among which are the silicon and phosphorus content of the iron and the rate of cooling, affect the total carbon content and/or the ratio of free and combined carbon. Combined carbon imparts strength to the iron, but, over a certain content, higher carbon makes the iron increasingly brittle. Carbon content of pig iron is not controllable in the blast furnace and is consequently generally not specified.

Manganese dissolves in iron in practically all proportions forming a solid solution. It increases the strength of iron and is a definite aid in its subsequent refining. In a steelmaking furnace, its presence is particularly desirable since it aids in sulphur removal and also tends to decrease the harmful effects of sulphur carried over into the steel.

Phosphorus forms iron phosphide which dissolves in the iron, making it brittle, and tends to reduce the total carbon content. This element cannot be removed in the blast furnace and all phosphorus in the burden is completely absorbed by the iron. Control of phosphorus can only be exercised by selection of raw materials.

Sulphur combines with iron and manganese to form sulfides which dissolve in the iron and render it brittle and weak. Since sulphur is difficult to remove in steel making processes, and its subsequent effect is generally harmful, high sulphur is undesirable. By proper control of slag basicity and temperature, good control of sulphur can be exercised in the blast furnace.

Silicon dissolves readily in the iron. Within limits, it increases the strength of the iron, but above 3.50 per cent the metal becomes extremely brittle. Because of the acid nature of its oxide, the silicon content of pig iron or hot metal for the basic open hearth should be held below 1.25 per cent to prevent excessive erosion of the furnace lining. For the bessemer process, higher percentages are desired for the large quantity of heat furnished by its oxidation.

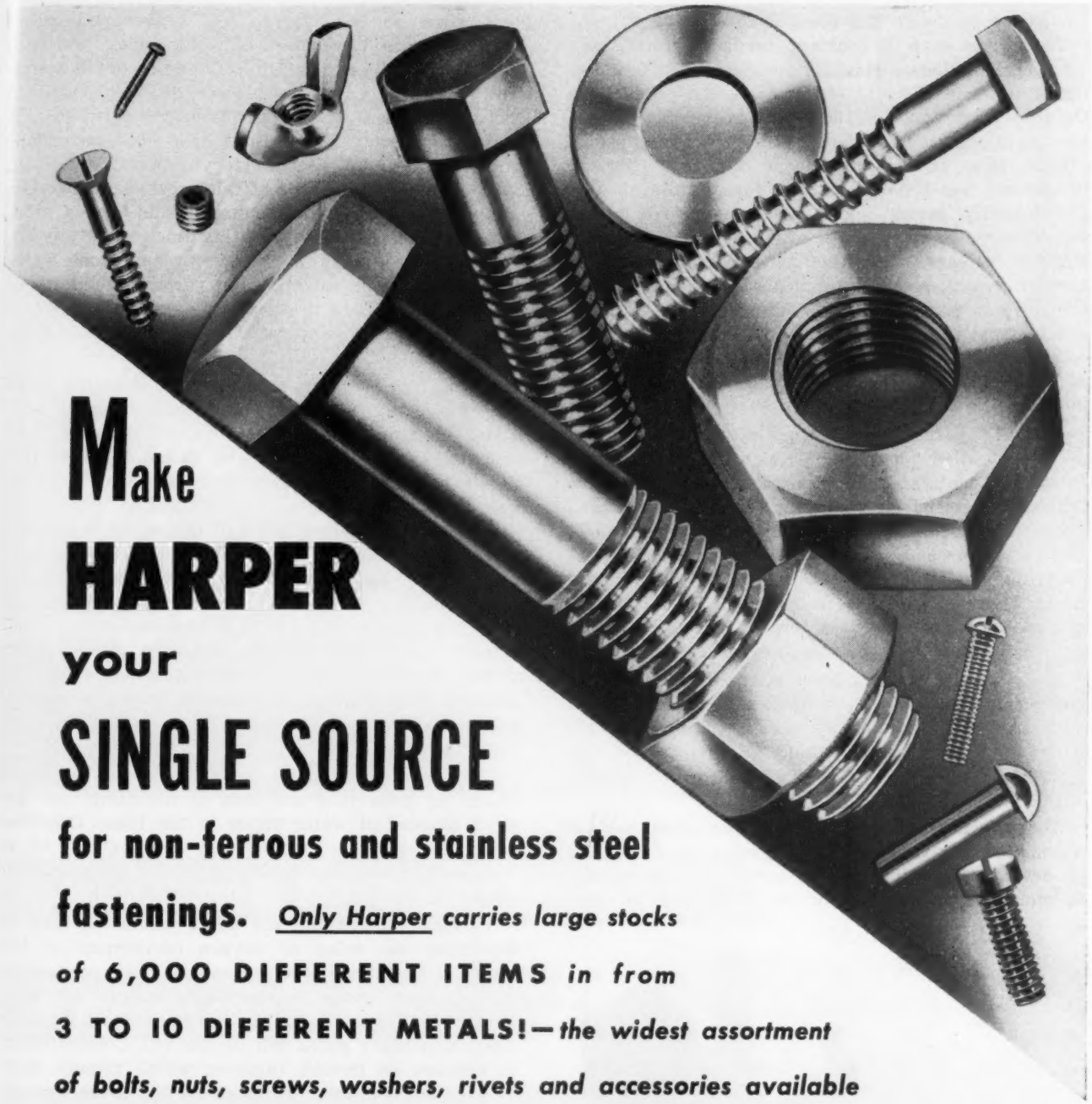
Pig iron was originally graded by a very complex system involving fracture appearance, geographical location of furnace with reference to raw materials and an antique numbering system. Although iron is still classified by its method of manufacture with respect to fuels and blast, its intended use, such as basic, bessemer, foundry or malleable and by general chemical composition, such as low phosphorus or high silicon, a standard classification system based on chemical composition has been devised by the American Iron and Steel Institute.

The general chemical composition of the four important types of pig iron classified by use is shown below in table VII. Within the extreme ranges shown, specific grades are made to a variation of 0.25 per cent of manganese and silicon to 0.20 per cent of phosphorus.

Since the blast furnace produces on the average of a half ton of slag for each ton of iron produced, the matter of slag disposal becomes a vital item in the economics of blast furnace operation. Efforts have been made to develop outlets for this slag, but markets are available to use only slightly more than half of the enormous tonnage produced, which is around 30 million tons per year.

Some air cooled slag is sold without sizing, but the major portion is crushed and screened. Largest use of this material is for highway construction, mainly as a fill or as a base or insulation for macadam roads. About half of the marketed slag is used for this purpose. Another quarter of this product is used by railroads for road ballast. Much wet granulated slag is used for wall insulation or the manufacture of cement. Float slag is mainly used for insulation in sound proofing while other general slag uses are for concrete aggregates and sewage disposal beds.

The amount of combustionable material, mainly carbon monoxide, in blast furnace gas is approximately equivalent to 10 million Btu per ton of iron produced. Approximately 20 to 25 per cent of this gas is required for heating the blast in the stoves. An equal amount is generally consumed to supply power to operate various types of furnace auxiliary equipment necessary to pump the blast and cooling water and to charge the solid raw materials. The balance, which amounts to better than half of the gas produced, is surplus and available for other purposes such as underfiring coke ovens, firing boilers, or heating soaking pits or other reheating furnaces. For a large modern furnace, this surplus gas would be



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EVERLASTING FASTENINGS

equivalent to about 250 tons of coal per day.

There has been a constant tendency during development of modern blast furnace towards larger and larger units in order to obtain increased production. Only 25 years ago, the 1000-ton furnace was still in the mythical stage. Now 1500-ton furnaces are a reality. Most obvious manner in which to increase production has been to enlarge furnace dimensions. Consequently, recent furnaces are mainly all in the large hearth diameter range of 26 to 28 feet 6 inches. Further increase in hearth diameter is a moot question, at present, because of limiting facilities for filling the furnace. Some recent furnaces have increased the height from 90 to 110 feet in order to increase their working volume. However, these units have not been in production long enough to afford a satisfactory answer.

Over 40 years ago, James Gayley initiated the use of so-called "dry blast", which is air blast conditioned to contain a minimum amount of water vapor. Although tremendous claims for benefits in increased production and reduced coke consumption were made, little interest was shown in this operation until about 10 years ago when about 20 such installations were made. However, no new installations have been reported since, and all but a few of the users of this air conditioning have discontinued its use.

Basic idea of the dry blast is to control moisture content due to seasonal variations in humidity and to hold it at a constant low value. This moisture removal was accomplished either by refrigeration and precipitation of the water vapor or by dehydration with some chemical agent.

Theoretically, with moisture in the blast held at a constant low value of 1 to 3 grains per cubic foot of dry air, variations in the heat requirements due to moisture variation would be eliminated. In addition, since on the average less heat would be required for the dissociation of water vapor, less coke would be required to maintain the necessary temperature and heat balance. This should then result in more efficient and smoother furnace operation.

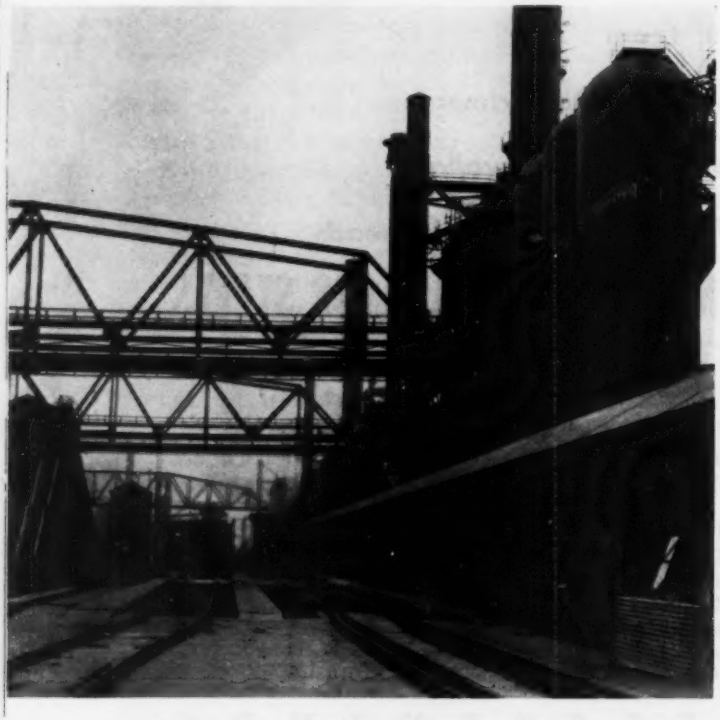


Fig. 24—Top of stock house showing coke, ore and limestone tracks. Transfer car seen at right

However, many installations have been abandoned and a number of contradictory reports have been made concerning benefits of this process. Apparently, other factors such as raw materials and type of product, affect the desirability of this practice. At present, it appears as though dry blast may have some value in regions subject to high and variable humidity or in some special practices, such as ferro-alloys, where both high hearth temperature and coke consumption are required.

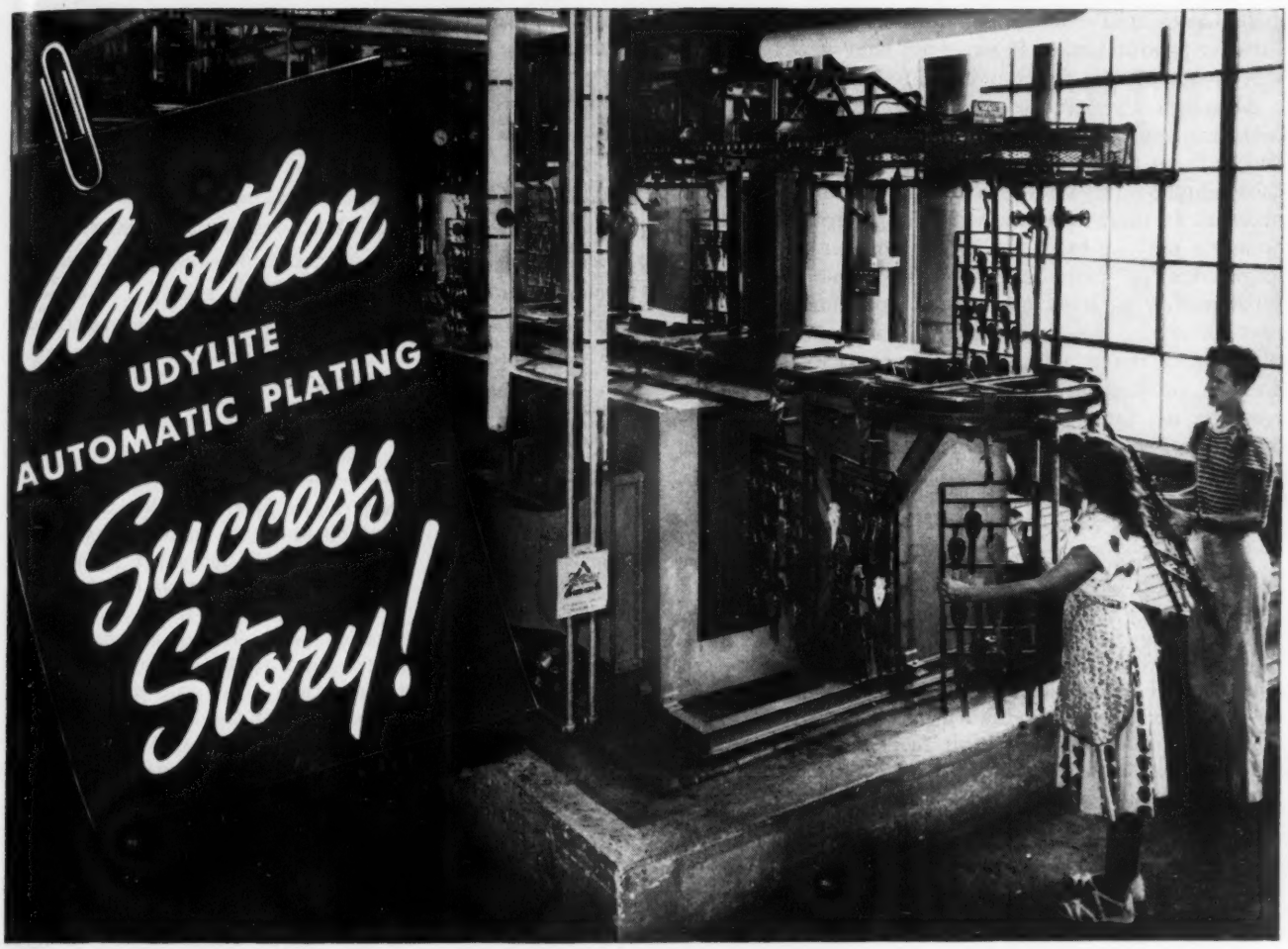
In contrast to the use of dry blast, some operators have found that their furnaces operate smoother with added moisture in the blast. Use of this wet blast eliminates the effect of variable moisture on the furnace's heat balance. However, presence of moisture does detract from the heat available since heat is required for the disassociation of the water vapor into hydrogen and oxygen. The heat loss is practically compensated for by an increase in the amount of reducing gases due to the presence of increased oxygen from the water which aids in the formation of carbon monoxide and also because hydrogen itself, under certain conditions, is a vigorous reducing agent. In addition this increase in reducing gases is accomplished without an increase in inert gases such as nitrogen.

In this process moisture is added as saturated steam in prescribed amounts to maintain the desired amount of water vapor in the blast. Opinions as to the optimum amount vary and contents of as high as 12 grains per cubic foot of dry air have been used.

Various experiments are being conducted now to determine the value of oxygen enrichment of the blast. It is claimed that, by reducing the proportion of the inert gases in the blast, mainly nitrogen, hearth temperature will be increased and sensible heat in chimney gases will be lowered. Consequently, it appears as though furnaces which require high hearth temperatures would benefit the most. Present indications are that any benefits from oxygen enrichment cease above 30 per cent oxygen enrichment of the blast.

Much emphasis is being placed today on increasing top gas pressure in the blast furnace as a means of increasing the furnace gas pressure. According to recent experiments, this increased internal pressure accelerates certain beneficial chemical reactions, such as the reduction rate of iron oxide by carbon monoxide. In addition, increased pressure will compress the gas volume which means that a greater weight of reducing gases will be in contact with the ore at any given time without increasing gas velocity. These factors should promote both increased thermal efficiency and production.

Claims have been made from actual test runs that approximately a 10 per cent increase in production can be expected from a 1½ to 10-pound increase in top pressure. Since use of high pressure appears to promote better gas-solid contact, to decrease flue



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dust losses and coke consumption while increasing furnace production, it is expected that great interest will be shown the development in the near future.

Although the art of blast furnace smelting has been continually changing since its earliest history and will no doubt continue to change in the future, these changes have only been refinements of the basic process. It fact, even more rapid progress in developments may be expected in light of our present day knowledge of furnace reactions. These processing refinements, such as use of the hot blast, sizing of raw materials, use of coke as a fuel and the utilization of blast furnace gas, have all contributed to increased production and economy of operation with respect to manpower required. However, fundamentals of the process have not changed since the first molten iron was produced in central Europe during the middle of the 14th century.

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Carburizing-Martempering

(*Concluded from Page* 74)

an additional function of reducing temperature of the crankshafts below 275° following the 400° quench to obtain proper structure transformation before the work is drawn at 450° F. Draw bath depth is 18 inches, width 40 inches and length 6 feet.

From the draw bath, the chain conveyor F passes the loaded fixture through a hot water rinse, tank No. 5 in Fig. 4, to remove clinging salt. In this rinse, which is clear water at 180° F, the crankshafts remain 7 minutes. A second rinse, tank No. 6 in Fig. 4, for the same duration, and in clear water at identical temperature, follows for the purpose of drying the shafts. Transfer from the first rinse is accomplished by chain conveyor G.

From the second rinse and final operation in the furnace, the crankshafts and fixture resting on chain conveyor A continue to move toward the end of the furnace until the fixture is engaged by chain conveyor H of the jack rabbit mechanism, shown in Fig. 5. On this conveyor the fixture moves at somewhat accelerated pace back over the tops of the salt baths to be redeposited at its starting position on conveyor A at the charge end of the furnace. The return from the rear to the front of the furnace requires 62 minutes and indicates the relatively slow speed at which this conveyor travels. As the fixture approaches the starting position, the operator unloads it of carburized and martempered shafts and reloads it for the next trip. Heat treated shafts are deposited in truck boxes for transfer to the shot blasting department and subsequent return to the crankshaft line.

Handles 5 Charges Per Hour—Heat treating cycle just described, including four salt bath immersions, two rinses and return time, requires approximately 5½ hours. The furnace is in operation 22 hours per day and, during this period, handles 110 charges to give an hourly rate of 5 charges. On the basis that 13 crankshafts (the number loaded in one fixture) are an average charge and an average weight per shaft is 2¼ pounds, the furnace heat treats 65 shafts, or 146 pounds per hour. As the furnace requires only one operator, the foregoing figures also represent the man-hour production. At rated load, the hourly power consumed by the line is 200 kilowatt-hours.

The new method provides numerous and definite advantages, including larger production and lower unit cost. Carburizing is now being performed at a saving of around 35 per cent.

Major saving is in the elimination of the copper plating operation formerly required. Other economies accrue from less handling and trucking time, complete absence of scaling and decarburization, elimination of one straightening operation because salt bath carburized shafts are straighter, less material needs to be left on the shafts for final finishing for the same reason and percentage of rejects is lower.

Fig. 6 is a longitudinal cross-section of an outboard motor crankshaft which has been macroetched to show the uniformity and depth of case obtained by salt bath carburizing.

Rejects Negligible—Operations performed on the crankshafts after heat treatment are shot blasting, straightening, finish grinding of all diameters and polish lap diameters. By the previous method of carburizing, rejects averaged 2 per cent and reworks the same amount; both items are reduced to negligible proportions by the salt bath procedure.

Salts used in the various baths are supplied by Park Chemical Co., Detroit. To maintain the carburizing bath requires weekly additions of approximately 400 to 450 pounds of new salt. The company also discovered that use of Energizer No. 2 is more economical than adding new salt. Energizer costs more per pound but less of it is needed, thus effecting the saving. Installed at a convenient location to the left of the furnace is a drag out tank to which the low-temperature draw salt used in furnace No. 3 for the isothermal quench can be transferred and held molten as furnace cleaning or maintenance may require.

Air Cleaners To Go Overseas

ASSEMBLY is in the final stages on electronic air cleaners for steel mills in the United States, Brazil, France and South Africa at the Sturtevant Division of Westinghouse Electric Corp., Hyde Park, Mass. These units are rated at 16,000 cubic feet per minute at a cleaning efficiency of 90 per cent or 36 tons of air handled every hour. According to the company, they may be used in multiples, the number depending upon the total volume of air to be cleaned.

When these Precipitron cubicles are installed and in operation, their louvers are in the open position and the power pack is energized. As the plates, comprising the collector cell, become loaded with dirt that has been removed from the air, a single control takes the unit out of service, closes the louver, washes the cell bank, applies fresh adhesive and puts it back into service.

Resists Sulphuric Acid

DEVELOPED during the war for very severe corrosive applications, Durimet 20, made by Duriron Co. Inc., Dayton, O., is now being made available in sheet and plate form.

One of its most widespread applications is said to be in the handling of sulphuric acid. Production for stock is being confined chiefly to gages 24-11 and to the smaller thicknesses of plate. The range is from 24 gage to ¾-inch plate.

LARGE WELDED PIPE

. . . manufactured on new low-cost equipment

HYDRAULIC press-forming and submerged arc-welding steel plate into pipe, in thicknesses ¼ to ½-inch or heavier, and sizes 8⅝ up to 30 inches OD or larger, now can be accomplished on a complete mill recently engineered and built by Yoder Co., Cleveland. The unit handles entire range between these sizes with one set of basic tooling—a big factor in reducing initial plant investment where a number of different sizes is to be made.

Heretofore, conventional methods for processing these sizes cost anywhere from $4 to $7 million. Initial investment in equipment, including tooling for range of sizes indicated, is reduced by the new procedure by one-third to one-sixth of these amounts.

Specially-Designed Components—The equipment consists of a plate flattener, edge trimmer, scrap chopper, edge scarfing and shot blast unit, such as ordinarily used in electric weld pipe mills in the preparation of skelp for forming and welding. Components peculiar to the process are three specially designed hydraulic presses for step-by-step cold forming into round tubes prior to welding. Also one, two, or more welders, of the submerged arc type which, with wire feeds, flux hopper, flux reclaiming system and generators are supported on an overhead bridge.

An entrance conveyor with chain type pusher propels the pipe through two pairs of squeeze rolls. These, together with entrance and exit guide rolls, are mounted on a welded steel base under the bridge. A welding mandrel, with water-cooled copper backup shoe, is supported on the overhead structure at the entrance end.

The tooling is also new. In general, the hydraulic press dies are made for the largest size of pipe, and then built up by means of filler pieces for smaller sizes to be made. This system reduces tooling cost to a small fraction of what it is where each size requires a fairly complete change of rolls or dies.

Pipe Formed Perfectly—By combining press-forming with arc-welding, each 40-foot length of pipe is perfectly formed and welded from end to end. Only scrap loss consists of about ¼-inch of metal removed in an end-facing machine installed next to the hydrostatic testing unit at the end of the production line.

The mill is furnished complete with conveyors between the various operating and processing units, for a continuous production line, with added semiautomatic facilities for taking the cold-formed lengths into and out of temporary storage before proceeding to the welding and finishing operations, and to final storage before shipping. Optional finishing equipment consists of units customarily employed for internal welding, flanging of ends, sand blasting, prime coating, oven drying, enameling, wrapping, white washing, etc.

Typical operation might be considered single shift of the skelp preparation and forming line, with two welders, each operated three shifts, to match the cold-formed output. To illustrate production possibilities with such a mill on five different pipe sizes and weights, the accompanying table gives figures estimated from performance records in a plant which has been in operation for about 1½ years. By double-shift operation of the forming line, and doubling the number of welders, the production may be stepped up proportionately.

ESTIMATED PRODUCTION, PRESS-FORMING, ARC-WELD PIPE MILL

Pipe Size, Inches	Footage	Wt. Lbs. per Ft.	Tons per Year
12¾ x 0.250	910,000	33.4	15,197
16 x 0.312	580,000	52.3	15,167
20 x 0.375	388,000	78.6	15,259
26 x 0.438	250,000	119.0	14,875
30 x 0.500	193,000	158.0	15,287
Annual Production	2,321,000 Feet	or	75,785 Tons

Advanced Casting

(*Continued from Page* 71)

deep, runs from 20 second to 4 minutes. A perforated stainless steel conveyor with variable-speed, continuous or intermittent drive, acts as the bottom applicator or ground.

Casting Facilities—A general view of advanced casting facilities is shown in Fig. 1. From left to right, and keyed numerically are the following: (1) Gas bottles for mold atmosphere; (2) electric convection desiccator for dehydrating ceramics; (3) special Globar heater to preheat Rayotube pyrometer target tubes to 2600° F; (4) Rayotube pyrometer assembly; (5) rack of reserve pyrometer lances; (6) 28-inch diameter centrifugal casting machine with rotating guard; (7) vacuum pump and tank; (8) 40-inch diameter centrifugal casting machine with rotating guard; (9) support column for head heating induction coil; (10) trajectory spout pouring basin; (11) support column for pouring basin—hydraulically operated for precision travel; (12) chart of cross-section of wheel casting on which moving indicator shows travel of pouring spout; (13) metronome for determining lifting rate of trajectory spout; (14) electronic control panel for new centrifugal casting machine; (15) rocking cradle for secondary pouring basin; (16) 20-horsepower variable-speed electronic-controlled motor for new spinners; (17) 200-kva, 800-volt, 3000-cycle induction heating unit; (18) new centrifugal casting machine with 72-inch diameter turntable; (19) 6 x 6 x 30-foot pit housing spinner drives; (20) pouring controller or metal meter which hangs from crane hook—in use this supports a ladle. It continuously records temperature of metal in the ladle, weighs metal poured and records pouring rate; (21) holding ladles induction heated to be equipped with bottom pour; (22) 20 feet to right is engine room housing diesel engine and induction generator for melting unit.

As to methods of casting, the research program has been directed at improvement of the centrifugal process and an original modification thereof designed as counterflow centrifugal or centripetal casting. At this point, therefore, it is essential that the reader understand the fundamentals of the two methods and the respects in which they differ.

Centripetal (Counter Flow Centrifugal) Casting—Centripetal force is that force which tends to impel a body moving or revolving around a center to move toward that center. By this method of casting, the metal proceeds or is directed toward the center at a uniform and controlled rate with the mold filling inwardly from the periphery. In a simple wheel

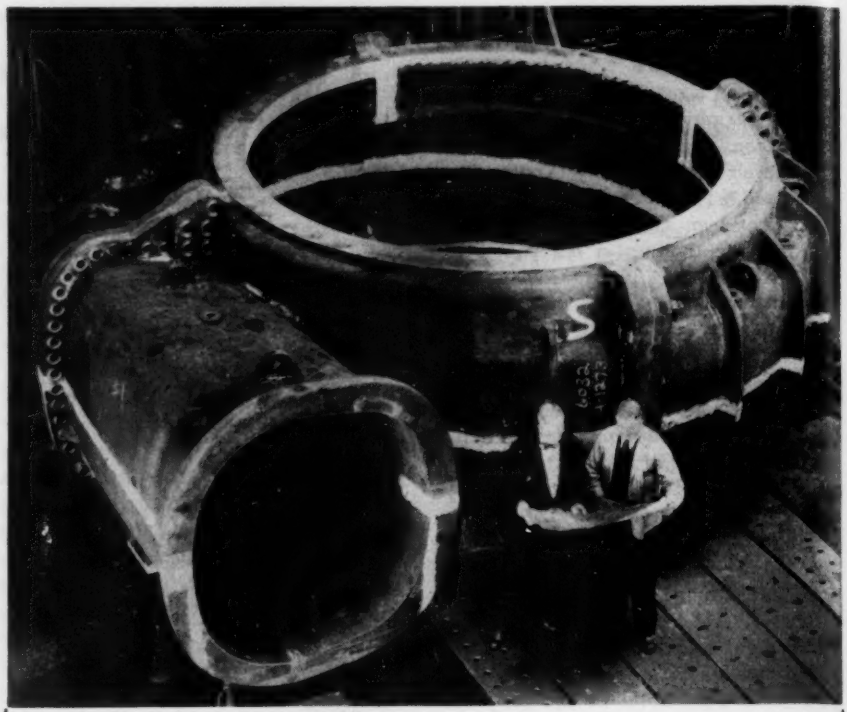
form the vertical down gate passes through the center of the hub to a point several inches below the hub. Metal then travels horizontally outward through spoke gates to a continuous or interrupted "ring" runner gate. This runner gate is several inches below the outer edge of the mold cavity and of approximately the same diameter. Small "pencil" gates extend vertically from this runner gate to the outer edge of the mold cavity.

As the mold rotates, metal is distributed centrifugally from the down gate through the "spoke" gates to the ring gate and thence upward to the outer edge of the mold. Thus, the metal that enters the mold is traveling with the mold at the same speed and is not thrown into the mold. It does not splatter shot and chase around the mold cavity contacting maximum mold surface and presenting maximum surface to oxidation as is the case with centrifugal casting. The metal proceeds centripetally toward the center. All cavities are completely filled from the head to the surface of the progressing metal; all but the leading edge of entering metal feeds from the gates into metal.

Any gating which radiates from a center downgate functions as a closed impeller pump with the fluid greatly accelerating in speed as it progresses toward the rim. As metal travels away from the center, increasing acceleration tapers the metal into diminishing cross section, leaving the radial gates only partially filled and causing them to inspirate air through the parting and function as a Venturi at point of mold entry. Choking to correct this causes a nozzle of the ingate to erode and splatter. Thus, there is much more erosion, air, and steam induction shotting and splatter in centrifugal casting than in conventional static casting.

Slow Rotation — Centripetal castings are commonly rotated at relatively slow speeds and a ferrostatic balance is maintained by adjusting the height and diameter of the downgate so that with sand gating the entire gating system may be kept full at all times with substantially no inspiration of air. Even if air should be inspirated, it is separated out in the ring gating structure which has substantially the same ferrostatic pressure as the highest pressure in the mold cavity.

In case of sand castings, the principal erosion takes place in the horizontal gating and dirt, steam, and gases are centrifuged out and trapped in the outer gating. The vertical ingates are so located as to feed metal from the clean metal at the center portion of the ring gate to the ingate. If these vertical gates — pencil or otherwise—in sand or erodable material should produce dirt for any reason this dirt can be trapped easily and effectively by small crap-traps on the inner edge of the vertical ingate just prior to mold entry.



TWO AND ONE-HALF BILLION: This many gallons of water will be pumped daily for irrigation purposes by each of five 84-inch vertical volute pumps, of which this huge casing is a part. Made of high strength GM Meehanite metal and weighing 121,050 pounds, the four-piece casing, with its four sisters, was made by Farrel-Birmingham Co. Inc., Ansonia, Conn., for Worthington Pump & Machinery Corp. The precision nature of the casting is illustrated by the close fit of the four components when assembled for the first time. When installed in California's Central Valley Project, each pump will have a capacity of 350,000 gallons of water per minute

Centripetal casting rotation is employed: As a means of equally, uniformly and controllably dividing and distributing metal; to trap and remove dirt through changes in form of gating cavities and orifices which it permits; through utilization of sufficient pressures to prevent infiltration of air into gating and mold cavities as the metal advances; and to permit centrifugal separation of eroded mold materials, the gaseous and solid by-products of the combustion of organic mold binders and entrapped air, steam or gas from the fluid metal.

Centripetal Casting Turbine Rotors —In most rotor and wheel forms the hub is thicker than the rim so that the hottest metal advances over the thinnest outer section toward the thick hub section. This has great inherent advantages. The hot metal liberates maximum heat to the mold due to the larger surface area of the thin section, thus preheating the mold and reducing the metal temperature as the metal advances to the thicker mold section with the lower surface-to-mass ratio. Consequently, the hot mold surface and the hot metal nearer the gate stay hot longer than would otherwise be possible. The coldest metal meeting the coldest mold surface in the thick section cools much faster than would otherwise be possible. This procedure tends to reduce greatly the temperature differentials, center line shrinkage, grain size differential, casting strains, and the stress of both pre and post-solidification shrinkage.

Centrifugally casting a large number of small castings or a small number of large castings in the same mold has never been widely accepted. This practice has met with decreasing approval as the casting weight increases and metal volume adds to the time, temperature and erosion of gating. The deficiencies of centrifugal casting are being increasingly understood.

Large molds create added difficulties due to the difficulty of multiple patterns, unorthodox gating, varying pressures and the well-known prob-

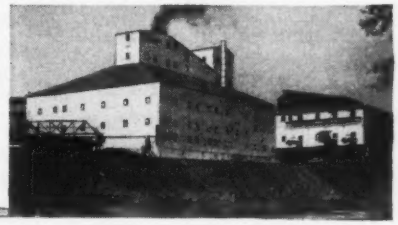
There is no shortage of good coking coals on the Baltimore & Ohio

To steel men looking for better coking bituminous, we recommend coals mined on the Baltimore & Ohio. *We know these coals.* They are low in sulphur and ash, and excel in other characteristics needed for efficient coking.

Not only is there an abundant present supply of coking coals on the B & O, but because of developing fields, B & O's *reserves* are increasing. B & O bituminous answers the need of blending for better coke and offers both accessibility and long-range availability. *Ask our man!*

BITUMINOUS COALS FOR EVERY PURPOSE

—from modern mines like this →



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BALTIMORE & OHIO RAILROAD

Constantly *doing things*—better!

lem of keeping large core molds flat, baking them uniformly and handling molds and core plates and keeping the plates flat. Added problems are the decrease in accuracy of molding machines in large size and of multiple matches and the multiplication of these problems incident to stacking.

Special knowledge is required of fluid metal hydraulics and of the control of temperature, pressure and flow essential to accurate control of mold filling so that each successive vertical mold cavity is largely solidified before the next is filled. Otherwise, great cumulative ferrostatic pressures proportional to the total area of the fluid metals in all molds filled create distortion, fins, runouts and clamping problems in statically poured molds. These become complicated by radiation.

Project Considerations — The foregoing enumerates some of the problems incident to a logical, complete and accurate evaluation of the centrifugal casting process and to the long and extensive research and development of the centripetal casting process. Included in considerations which project personnel undertook and evaluated were:

1. Mathematical considerations of principals of hydraulics applied to fluids moving at varying and rapidly accelerating speeds, varying pressures, temperatures, fluidities and surface tensions.

2. Evaluation of mold materials from sand through graphite to ceramics, including evaluation of heat transfer, particle size, permeability, wetting effects, heat shock resistance, etc., as well as bonding and methods of molding, pressing or machining to form.

3. Establishment of continuous temperature recording in the ladle.

4. Application of advanced heating methods to molds, to selected areas of molds and the control of solidification of castings in whole or in part and of the solidification of heads, gates, etc., by induction and dielectric means.

5. Consideration of mold atmospheres, evaluation of all disposable patterns from wax through plastics to frozen mercury and other fluids.

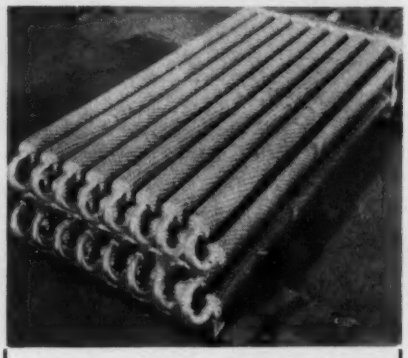
6. Application of refrigeration.

7. Plastic phase heat treatment control.

Master Casting Machine — Fig. 2 shows a sketch of the master casting machine built on the project for centrifugal and centripetal casting. It will mount a table from 3 to 10 feet in diameter, can handle a casting as large as a destroyer propeller, and has a capacity of 10,000 pounds. Uniform pouring temperatures and controlled cooling rate provide control of grain size. Drive is by a 20-hp full-torque motor giving variable speeds from 0 to 1500 rpm.

Metal can be cast under pressure or vacuum in any desired atmosphere. Molds, gates, heads, or any portion of the molds can be heated while rotating by induction or dielectric circuits. Induction heating capacity is 200 kw at 3000 cycles. The machine is designed to be equipped with brine cooling from a refrigeration unit partially installed. A hood over the machine and blower exhausting through the hollow 11-inch internal diameter shaft will evacuate all smoke and gas from the hood to outside the foundry.

Fig. 3 shows a cross-section of the trajectory pouring tube, this consisting essentially of a ceramic pouring basin and graphite shroud tube encasing a ceramic pouring tube of approximately 1⅛ inches inside diameter. At the bottom of the latter is a ceramic spout cup with an orifice of ¼ to ⅜-inch diameter. The pouring tube is supported by a pouring rig which is raised hydraulically to perform pouring at a controlled rate. When the tube has been raised to a predetermined height as indicated on the mold cavity profile standing at the right of the rigging, the tube is removed quickly and pouring is resumed direct into head of the mold.



MORE FINS—LESS LENGTH: Reduction in pipe length made possible by the addition of fins to these heat exchanger coils requires less refrigerant to charge the system, thus making a compact evaporator. Crimped steel fins, made from hot rolled strip furnished by Bethlehem Pacific Coast Steel Corp., San Francisco, are wound onto Ammonoduct steel pipe under high tension, thus giving a good mechanical bond between fin and pipe surface, according to California Steel Products Co., Richmond, Calif., makers of the finned pipe

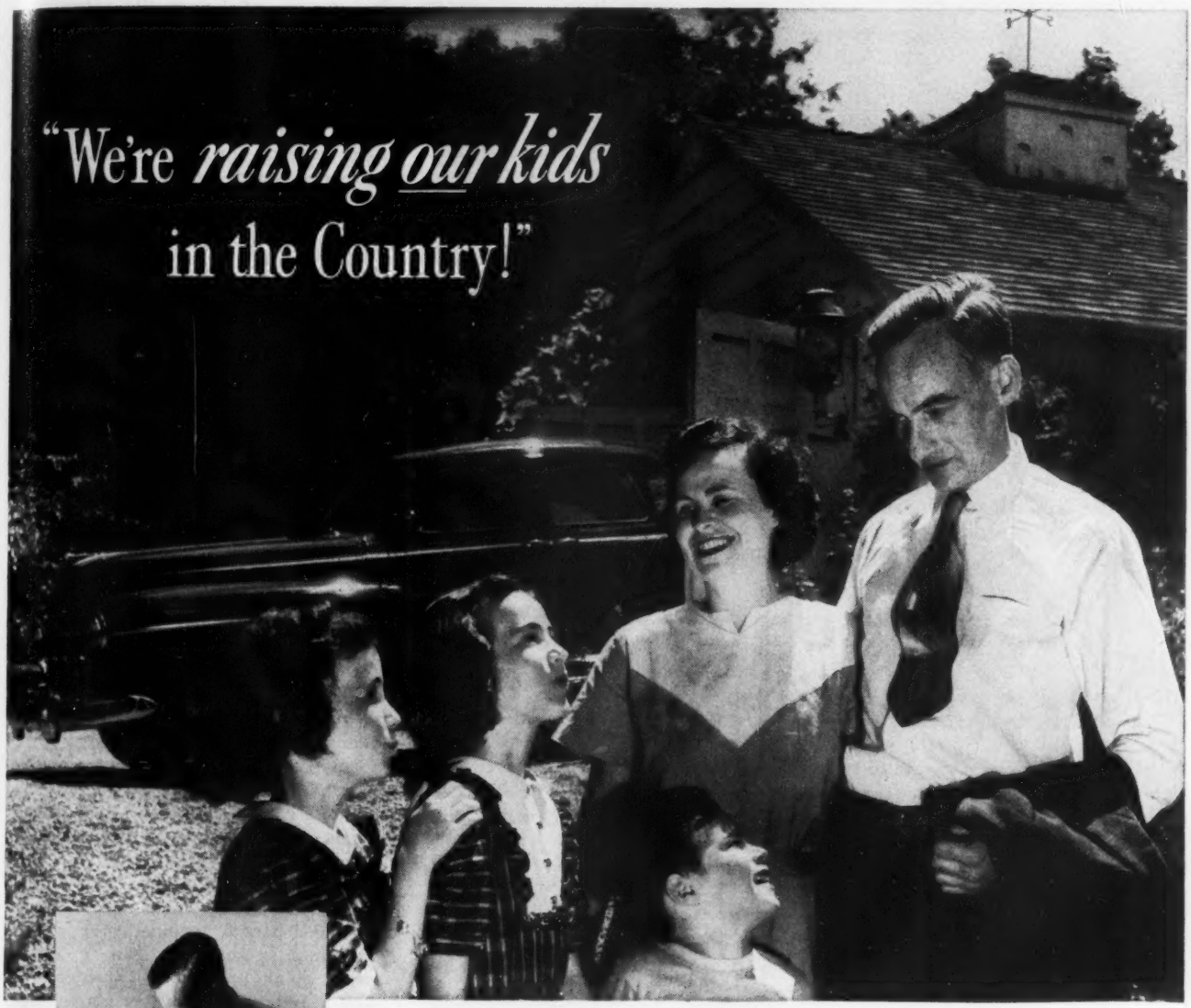
Pouring of a casting with the pouring basin and trajectory spout is shown in Fig. 4. With pouring completed, induction support is turned on to control solidification of the head. Solidification is checked by plunging a series of probes into the head, as shown in Fig. 5. An additional function of the probes is to keep the head from closing over from heat loss at the top.

The metal meter or pouring controller, indicated as No. 20 in Fig. 1 and sketched above the master casting machine in Fig. 2, has three-fold function: 1. To measure and record continuously temperature of molten metal in the ladle; 2. to weigh and record amount of metal poured; and 3. to record pouring rate. The device is suspended on the crane hook and in use supports the ladle. It mounts a dynamometer scale, clock and two Leeds & Northrup pyrometer recorders, one recording, six platinum-rhodium lance thermocouples intermittently immersed in the ladle, the other recording a new Rayotube radiation pyrometer with target tube immersed in the ladle. It also carries 32-v dc batteries and 110-v ac to drive the recorders, movie camera and cooling fan and to power four photo lamps. The camera records on movie film the weight of metal poured from the scale suspending the ladle against time shown on the clock.

Because grain size control, accurate control of shrinkage and erosion of mold material are dependent upon temperature control, improved pyrometry for reading and recording metal temperatures in the ladle is essential.

Radiation Target Tubes—A project in connection with the contract was the development of radiation target tubes to withstand continuous use for one heat of metal. Success attended this effort in development of the ceramic RP-10 tube No. 2, which is a tapered target tube having a hemispherical end and 3/16-inch wall section. This forms the target for a Leeds & Northrup Rayotube radiation pyrometer and is secured to the tube by a semiflexible metal coupling coated with special refractory cement at the slag line.

Target tube assembled on the Rayotube is preheated to 2600° F. in the electric Globar heater shown as item No. 3 in Fig. 1. Following preheating, the target tube assembly is attached to the ladle with the target tube immersed and the Rayotube connected to the recorder in the metal meter beneath which the ladle is suspended. Slag always has fouled immersion units, but short life of the unit has minimized this problem. The slag problem multiplies with suc-



Gordon Sauerbrun is a draftsman, working in Teterboro, N. J. But he lives in the country with his family. STEEL and the automobile are the primary reasons why he—and millions of others—can enjoy the advantages of working in industry and living in rural surroundings.

Gordon Sauerbrun was born and raised in a city. Eight years ago he bought a home in the country. "If it weren't for our car," he said, "I couldn't have bought a house out here. Fresh air and sunshine for the kids to romp in, a vegetable garden, lots of room and quiet. Believe me, that's nice to come home to."

Late last year Sauerbrun bought a new car for around $2000. To make that same car in 1910 would have cost $60,000, using the tools, steels and methods of that period. Cars are within the price reach of the Gordon Sauerbruns today because of progress and competition—among automobile and accessory manufacturers, and among the nation's 247 steel companies.

Almost 1½ tons of steel are used in the average automobile, about 84 per cent of the car's total weight. That is an increase of half a ton over 10 years ago. So much steel is used in automobiles because it is the best material for the job, and also because it *costs less* than any other metal.

The steel companies have done their share in making it possible for Americans to own 30,000,000 passenger automobiles—four-fifths of the world's total. This has brought better living for the Gordon Sauerbruns and millions of other families.

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Now tough tape straps coiled steel

Usual methods of strapping coiled ribbons of stainless steel were causing damage in shipment until this manufacturer discovered "SCOTCH" Filament Tape No. 880. Now banding is done faster, easier—profit loss through strapping damage has practically been eliminated.

You can use this amazing new tape for your toughest bundling, packaging, or strapping jobs! Use it wherever you need great strength plus flexibility—wherever *you* want faster, neater jobs.

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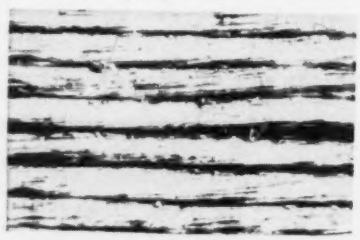
Here's why THIS TAPE IS A STRAPPING SUCCESS

MICROPHOTO SHOWS filament construction of "SCOTCH" Filament Tape No. 880. Acetate backing is removed to reveal "cables" in tape. Each "cable" contains 60 untwisted rayon filaments which run unbroken for the entire length of the tape. As many as 5,000 high-strength rayon filaments for each inch of width! These "cables" reinforce the tape just as steel rods reinforce concrete.



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cessive use of longer life tubes. A lime and ceramic coating was developed which dissolves slowly, fluxing the slag and keeping the tube practically free from slag interference.

Fig. 9 shows the assembly of corebox patterns for casting bladed and shrouded steam turbine rotor, designated as "M". The core is made in a special liquid plastic bonded sand with ceramic facing. The ceramic segments "F", which form the precision cast blades requiring no machining are located by 158 radial pins inserted between outer ring "C" and middle ring "D" for alignment, and hold blades between middle ring "D" and inner ring "G", all of these rings being locked by part "B". "A" is a gate core with ceramic distributor cup in center. "H" is aluminum facing which mounts on print on "B" and forms face of wheel. "K" and "L" are ring and disk coreboxes, respectively. Pins "J" are vertical ingates at rim for centrifugal casting.

Fig. 6 is the corebox for the 79-blade shrouded steam turbine rotor for preliminary studies of gating, metal flow, shrinkage, etc. This wheel was cast originally first in sand and then in ceramic cores. The ring core forms the 79 buckets or blades of the turbine wheel. Metal section of the buckets ranges from 1/32-inch at the edges to 5/16-inch in the center. Blades form a 16-inch circle cast integral in the shrouded wheel.

The 79-blade centripetally cast shrouded steam turbine rotor rough machined is shown in Fig. 7. Blade edges clean up and the shroud section is reduced in finished machining.

Fig. 8 shows a slab cut through the center line of a 340-pound gas turbine rotor disk. The alloy is N-155 containing equal percentages of nickel, chromium, and cobalt, approximately 21 to 23 per cent each. It will be noted that the structure is extremely good; it is uniform, relatively even and well centered. Sufficient chill has been imparted to attain a columnar rim of fine proportions tapering to equiaxed grain in hub.

Of considerable metallurgical significance is the fact that in the gas turbine rotor disk there has been obtained for the first time in a large casting a very fine-grained center with slight difference between the center of a section on which can be drawn a 7-inch circle and the smaller section approximately 2 inches thick. This is because for the first time in casting ferrous alloys it has been possible to control the Btu input accurately by utilizing the metal meter for measurement and a controlled orifice for the trajectory spout, permitting a definitely controlled rate of the Btu entrance into the mold, as well as Btu transfer from the mold.

New Products and Equipment

Maneuverable Fork Trucks

Increased maneuverability and faster handling of materials in confined storage areas are advantages of the special short-turn models of the electric battery-powered Clipper, Carloader and Utilitruc truck, fork trucks, offered by Industrial Truck Division of Clark Equipment Co., Battle Creek, Mich. These models

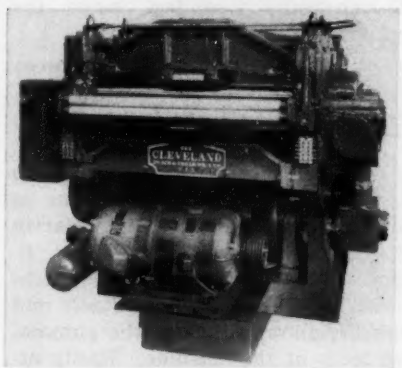
are of 2000, 4000 and 7000 pounds capacity, respectively.

Redesign of the battery compartments and counterweights provide angled corners which have reduced the turning radii by 6½ inches on the smallest model, 6¼ inches on the 4000 pound truck and 6 inches on the largest model.

Check No. 1 on Reply Card for more Details

Shear, Roll Feed Automatic

Cleveland Punch & Shear Works Co., Cleveland 14, O., is offering a 48-inch automatic shear and roll feed. Equipped with an electrically controlled positive jaw clutch, the shear has a capacity of 48 inches of



1/16-inch steel, Rockwell 90 B scale and operates at 60 strokes per minute. Due to a time delay in feeding stock, the number of cuts depends on the length of stock fed into the shear.

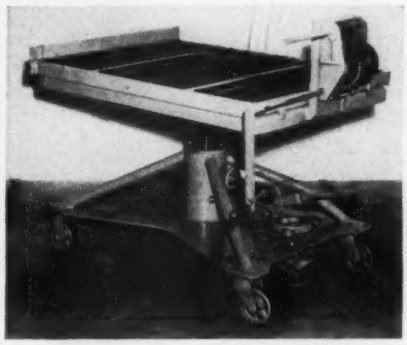
Roll feed consists of fine straightening rolls and two sets of pinch rolls. It is arranged with an electrically controlled drum type clutch. Feed on illustrated machine operates at 120 inches maximum and 6 inches minimum at the speed of approximately 200 fpm. However, when desired, a greater maximum length of feed can be provided for.

Check No. 2 on Reply Card for more Details

Table Lifts Overhanging Dies

Thirteen rollers set on 3-inch centers which extend slightly above the side channels for handling of overhanging dies are incorporated in the design of a hydraulic elevating table available from Lyon-Raymond Corp., 2798 Madison St., Greene, N. Y. Table has a top 31 inches wide and 42 inches long.

Special model has a single removable retaining bar which prevents dies from rolling off the open end of the table. Full dies from presses and storage racks, a 35-to-1 ratio



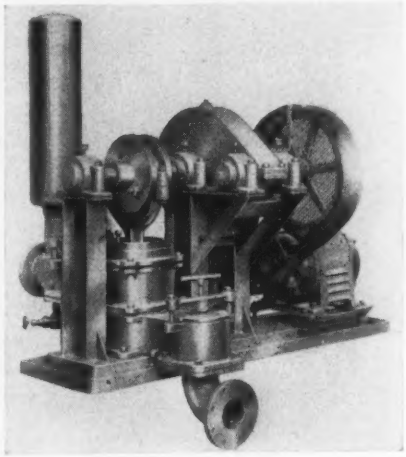
hand winch is furnished with 15 feet of steel cable. Table elevates from a lowered position of 22 inches to an elevated height of 30 inches. A single speed foot pump enables the operator to position dies weighing as much as 2000 pounds.

Check No. 3 on Reply Card for more Details

Diaphragm and Plunger Pumps

Motor and engine driven diaphragm and walking-beam plunger pumps and eccentric drive plunger sludge pumps, a line of thirty basic models, sizes and types, is offered by Marlow Pumps, Ridgewood, N. J. From these basic models the range is broadened by variations and combinations of materials, fittings and drives to meet virtually any heavy-pumping need. They have applications in the transfer of liquids that are too heavy for self-priming centrifugal pumps.

Engine-driven diaphragm pumps basic in the new line include two 3-inch and three 4-inch models, supplied as base mounted or with steel wheels or pneumatic tires. Capacities range from 3000 to 9000 gallons per hour. Three engine-driven walking beam plunger pumps, supplied with the same mountings, have capaci-

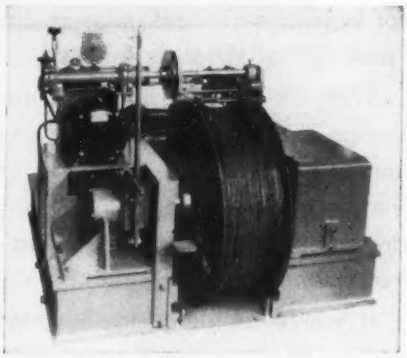


ties from 4200 to 6500 gallons per hour. Eccentric drive plunger sludge pumps are available in four and six inch sizes of capacities from 3000 to 14,400 gallons per hour. All are virtually clog-proof.

Check No. 4 on Reply Card for more Details

High Speed Spooling Unit

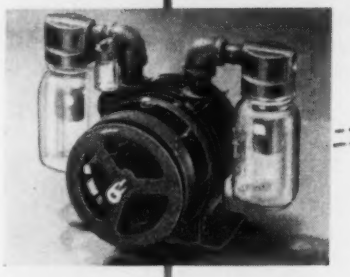
Heavy welded steel construction to withstand the forces and loads incurred by deceleration are incorporated in the design of a high-speed spooling unit for use where tension control and constant lineal speed are



important, a product of Black Industries, 1400 E. 222nd, Cleveland 17, O. Unit can be adapted to many applications that require take-up or winding equipment, such as web processing,

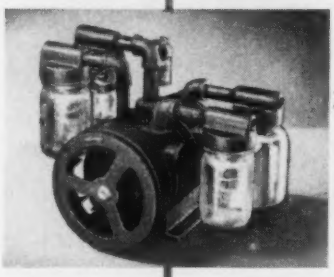
To feed materials automatically...

3 NEW GAST AIR PUMPS



GAST ROTARY DESIGN GIVES *BOTH* VACUUM *AND* PRESSURE FOR FEEDING APPLICATIONS

Model 3040, new SINGLE CHAMBER PUMP—19 to 24 c.f.m. Pressure up to 10 p.s.i.—vacuum 15" and over.



Model 10 x 1040, small DUAL CHAMBER PUMP—9 c.f.m. from each chamber. Vacuum to 20", pressure to 15 p.s.i.

Model 11 x 1740, large DUAL CHAMBER PUMP—14 c.f.m. (to 10 p.s.i.) from pressure chamber; 9 c.f.m. (to 15") from vacuum chamber.

WRITE FOR DETAILS ON 3 NEW AIR PUMPS—ALSO "APPLICATION IDEAS" BOOK

Look what these 3 new Air Pumps offer: They're designed to meet the specific needs of automatic feeding operations . . . handling paper, cardboard, thin metal, acetate, etc. They give *both* strong "blow" for separating—and large capacity low vacuum for "pick-up" of sheet materials.

With all the inherent advantages of Gast Rotary Design, they run quietly, producing large volume per horsepower at comparatively low speeds. They're trim in appearance and unusually compact. V-belt drives simplify installation and make speed control easy.

If you're building machines that can be fed with suction fingers—you'll want full details. Remember —"Air may be *your* Answer!"

GAST ROTARY

AIR MOTORS · COMPRESSORS · VACUUM PUMPS

(TO ONE H.P.) (TO 30 LBS.) (TO 28 INCHES)

GAST MANUFACTURING CORP., 133 Hinkley St., Benton Harbor, Mich.

strip stock takeups, payoffs and rewinders. It can be supplied with or without the level-wind traversing mechanism.

Unit illustrated is designed to operate directly from the finishing block of a wire drawing machine, finishing at 1500 fpm wire speed. The spool will carry 500 pounds of wire. Provision is made to adjust the tension between 10 and 20 pounds as required. Deceleration of the full spool is controlled by an interlock arrangement.

Check No. 5 on Reply Card for more Details

Dolly Truck for Strip Steel

Up to 5 tons of long strip steel, pipe, etc., may be handled by two men with two of the 3-wheel dollies made by Wenthe-Davidson Engineering Co., 1459 N. 31st St., Milwaukee 8, Wis. Both ends of a load can extend as much as 5 feet beyond each dolly, and short corners can be turned easily in restricted space. An adjustable steel chain attaches to the

bolster of each dolly, holding them together, and preventing shaking of the load from either.

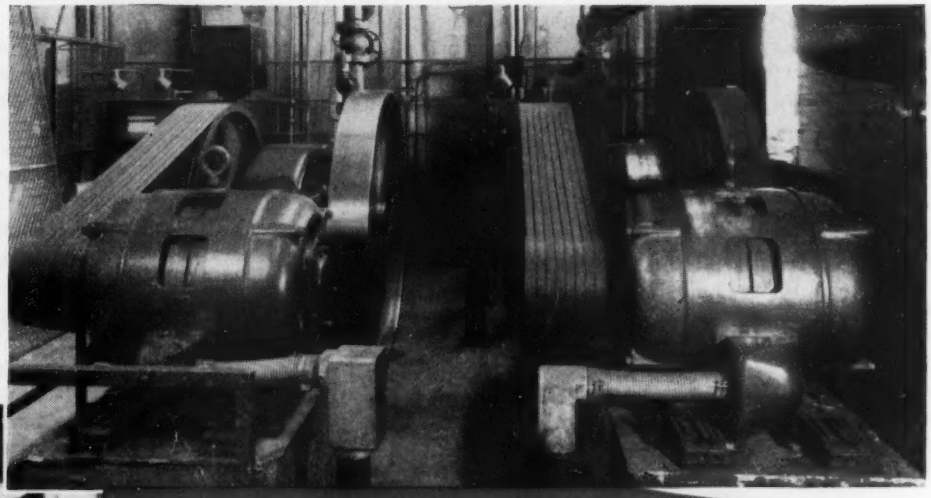
When ready to unload, the connecting chains are unhooked and a lift truck fork or crane is run under the load and lifted. Width is 28 inches and overall length 54 inches, with a 30-inch wide load bed inside the bolster.

Check No. 6 on Reply Card for more Details

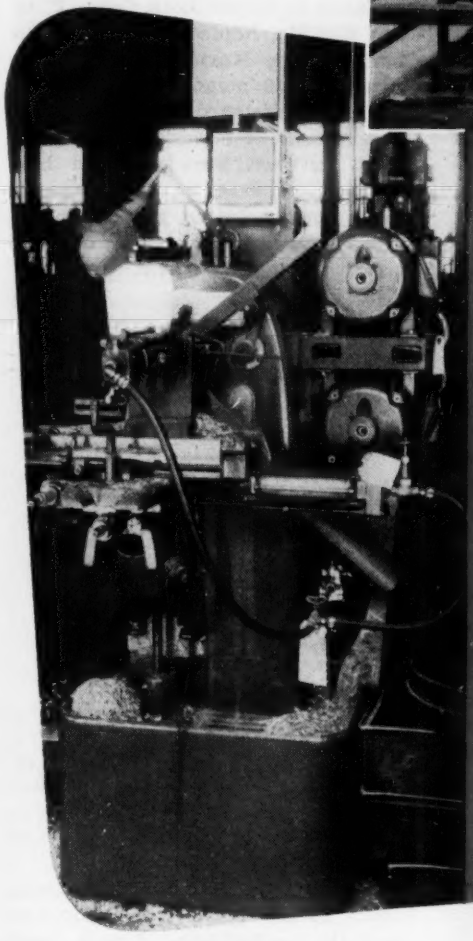
Milling Machine Attachment

Greater versatility is given to bench milling machine by a line of attachments announced by Marvin Machine Products Inc., Canton, O. Model V-1200 vertical mill attachment is driven from the bench mill spindle, allowing use of the automatic feeds of the machine. Easily attached, the unit can be fed at angles, pulled out past the travel of the table for large overhanging work. It is machined to slip over a 1½-inch overarm and is easily adapted to other

Two Century 100 horsepower squirrel cage motors drive air compressors which furnish air for portable tools, industrial furnaces, air lifts, air chucks, moulding machines, cleaning, etc.



Two Century 1 horsepower totally enclosed squirrel cage motors operate this automatic miller which produces 700 pieces per hour. Enclosed design protects against flying chips.



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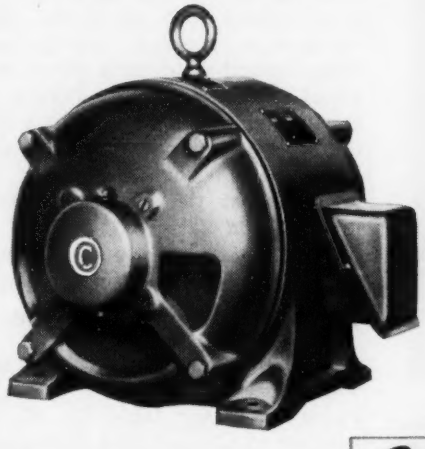
Specify the Correct Century MOTOR

—Complete Line Meets the Requirements of All Popular Applications



Popular sizes of standard ratings are generally available from factory and branch office stocks.

Century motors are available in a wide range of types, in sizes from 1/6 to 400 horsepower, single phase, polyphase and direct current. Where atmospheric conditions create a hazard, Century motors are supplied with splash proof, totally enclosed fan cooled or explosion proof frames, according to the nature of the hazard.

The two illustrations are typical of the widely varying applications, where Century motors furnish dependable power.

Century motors are built to stand up under the toughest operating conditions. Rugged frames, accurate machining, large shafts, accurate alignment, good mechanical and electrical balance—all contribute to their outstanding performance.

Specify Century motors for all your electric power requirements.

Century C MOTORS -640

CENTURY ELECTRIC COMPANY

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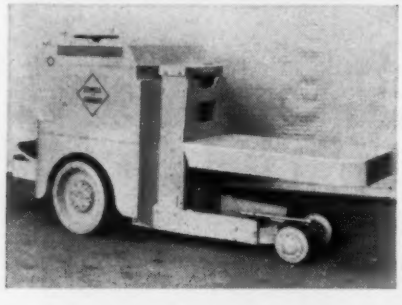
size overarms by bushing or turning down a special overarm.

Slotting attachment S-1070, attached to the bench mill spindle, makes possible the production of dies, squared or splined holes, internal gears and other shapes. It also can be set at angles or pulled out past the table travel. Stroke is adjustable from 0 to 2 inches. Model R-1102 rotary table, is proportioned for bench mill or shaper. The 6-inch table is graduated in degrees, locks from the bottom and has a hardened and ground worm with a 40 to 1 ratio.. Three 3-inch index plates and hand wheels are furnished.

Check No. 7 on Reply Card for more Details

Power Truck Has Medium Lift

Elwell-Parker Electric Co., Cleveland, O., has developed a new power truck with medium high lifting range which affords the driver a clear view of loads and areaways for fast maneuvering. With a top-of-platform range of 12 to 36 inches, the truck



will handle several different height skids.

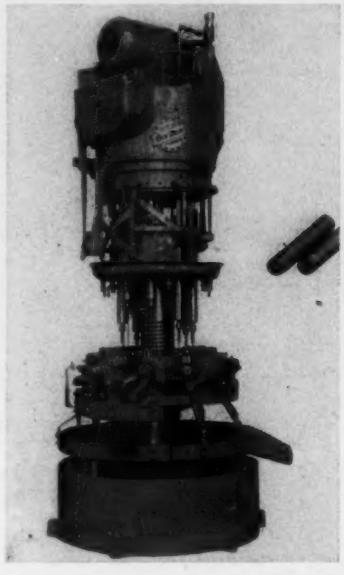
Capacity ranges from 4000 to 10,000 pounds. It raises or lowers its load from minimum to maximum level in less than 1 minute. Travel speed is 4¼ to 6 mph. Truck is equipped for all-electric or gas-electric drive.

Check No. 8 on Reply Card for more Details

Vertical Driller is Automatic

Change gears for governing both cycling time and spindle speeds result in a wide range of operation condition for the Roto-Matic SV vertical continuous drilling machines offered by Davis & Thompson Co., Milwaukee 14, Wis. In many cases the full range of the machines cannot be utilized because of the operator's inability to load the unload work pieces within the range of the machine, although clamping is automatic. When set up for the reaming of valve guides, fixturing and automatic ejection have solved this problem.

Eight 20-station automatic indexing type fixtures are mounted on the eight-spindle vertical drilling machine. After the operator has filled the station of the loading magazine

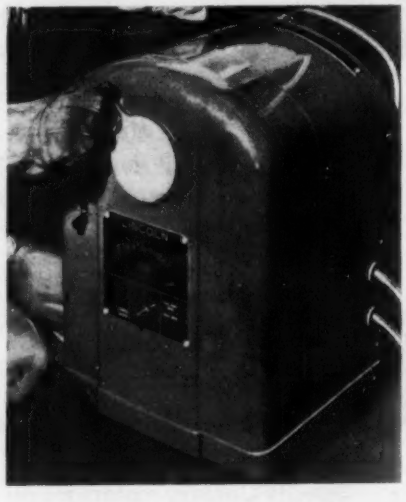


with the guides, the machining and ejection cycle becomes automatic. Upon completion of the reaming operation, a return cam retracts the spindle to its starting position and the guide is then clamped automatically.

Check No. 9 on Reply Card for more Details

Extra Capacity in Arc Welder

Lincoln Electric Co., Cleveland 1, O., is offering the model 200 Fleetwelder alternating current industrial type welder which, with its arc booster and reserve capacity, is suited for both job shop and industrial welding. A NEMA rated unit, it has a considerable reserve capacity over



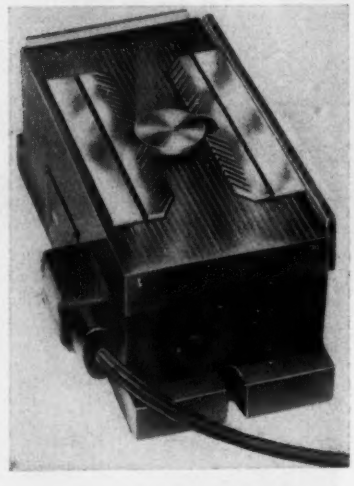
its rated maximum load of 250 amp. Welding may be on thick or thin material.

Electrodes ranging in diameter size from 5/64 to ¼-inch may be used. Low current welding of thin sheets is simplified and high-current welding of heavy plate is made faster through the arc booster, which adjusts the welder to start the arc automatically when the electrode touches the work on either thin or heavy material. Continuous adjustment of the welding current through the complete range is by the control handle.

Check No. 10 on Reply Card for more Details

Magnetic Clamping Device

Hanchett Magna-Lock Corp., P. O. Box 816, Big Rapids, Mich., is manufacturing the Magna-Vise consisting of a pair of magnetically actuated clamps, so designed that work parts of nonmagnetic materials may be located between the jaws and held against the face of the magnetic chuck for machining purposes. Device increases the usefulness of magnetic chucking equipment by making



it applicable to hold rigid types of nonmagnetic material.

Work is placed on a magnetic chuck surface between the clamps so that the toothed edge of each clamp is in contact with the work. Each clamp is composed of two steel sections connected to each other by a preset spring steel strip. Jaws of the clamps are forcibly drawn to a horizontal position by the magnet when energized. Welding action of the jaws against the work piece holds it securely in place.

Check No. 11 on Reply Card for more Details

Worm and Gear Turns Table

Feed through a worm and gear with a ratio of 40 to 1 turns the Palmgren rotary table No. 86, announced by Chicago Tool & Engineering Co. 8383 S. Chicago Ave., Chicago 17, Ill. The 8-inch diameter table has two ⅝ x 1⅛-inch T-slots crossing at the center. A 1½ inch reamed hole at the center of the table sur-

face is for a locating plug.

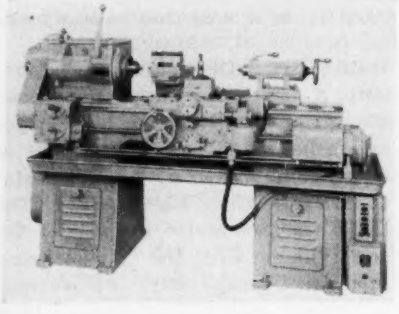
Table is graduated for the full 360 degrees and the rotary indexing dial is graduated in 15 minute intervals. Two hold-down clamps, with thumb screws are furnished for locking the table in position after indexing.

Check No. 12 on Reply Card for more Details

Lathe Features High Speed

For the average turning and facing job on the new Clipper automatic high speed manufacturing lathe introduced by R. K. LeBlond Machine Tool Co., Cincinnati 8, O., there are no cams to make or change. Machine features ease and simplicity of setup for any given job. Starting point is determined by position of the micro-length limiting switch on the bed. Length of cut is determined by setting of the automatic length stop on the trip bar.

The machine runs automatically through a complete cycle—plunge to

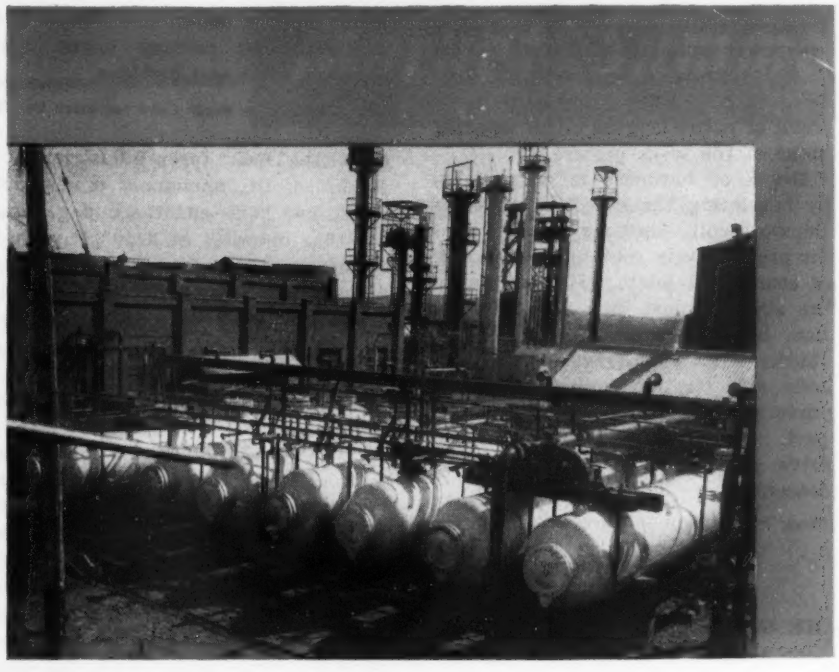


depth, turn, tool relief and rapid traverse to starting position. Use may also be as a semiautomatic or manually-operated lathe. Swing over bed and carriage wings is 14⅞ inches. Three headstocks are offered: Regular antifriction head, for medium speeds, has two ranges of six selective speeds each, 68 to 400 rpm or 102 to 600 rpm; high speed antifriction head with two ranges, each with six speeds, 200 to 1200 rpm or 250 to 1500 rpm; a high speed motor head with motor built into headstock, furnished with one of nine spindle speed combinations varying from 450 to 3600 rpm.

Check No. 13 on Reply Card for more Details

Surface Hardening Machine

Faster surface hardening of shafts, bars, lead screws and fabricated parts up to 5 feet long and 3 inches OD may be carried out with a progressive feed high-frequency heating machine designed by the Lepel High Frequency Laboratories Inc., 39 W. 60th St., New York 23, N. Y. Parts which usually require high-power units may be processed pro-



FIRE PROTECTION *Tailored* FOR INDUSTRY'S NEEDS

Not unlike the clothing industry, effective fire protection must be tailored to fit the need . . . tailored to each individual requirement—occupancy—hazard and risk. Recent advancements now make it technically and economically possible to handle problems of extreme hazard to personnel and to production continuity. A typical problem was the storage of propane at the illustrated refining operation. With the problem studied, the hazard analyzed and the measurements exactingly approved, specialized *Automatic* FIRE-FOG was installed and is today, ready, willing and able to combat fire at the first indication of flame.

Many installations of this and similar nature have been made in chemical processing properties throughout the country and, like any worth-while product, *Automatic* FIRE-FOG stands on its records of achievement . . . records which are written into the reports of all leading fire insurance bureaus.

Whether your needs call for *"Automatic" Sprinklers* chemical or mechanical foam, CO_2 gas, *Automatic* FIRE-FOG or a combination system of protection, our preliminary engineering service now makes it possible to fairly evaluate the economic and adaptability features of each method for your own risk. Detailed information is available upon request. Write or call today.

Automatic FIRE-FOG
- IT BLANKETS - IT ISOLATES - IT QUENCHES -

. . . a famous member of the *"Automatic" Sprinkler* Family . . . provides basic fire protection for process equipment and storage in the chemical and petroleum industries. On-the-spot protection for quench tanks, dryers, explosive hazards, conveyor openings, air filters, oil filled electrical equipment and other units vital to production line operations.

"AUTOMATIC" SPRINKLER CORP. OF AMERICA
YOUNGSTOWN 1, OHIO

"Automatic" Sprinkler
FIRST IN FIRE PROTECTION
DEVELOPMENT · ENGINEERING MANUFACTURE · INSTALLATION
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

gressively with the use of relatively low-power equipment. Known as the P 60 progressive feed unit, it may be used for either continuous hardening of entire lengths or for selected areas of the work piece.

Depth of hardness is controllable by regulating the speed of travel of the work coil. Unit may also be used for progressively soldering or brazing of seams and joints. Machine takes the shaft or part in a vertical position, between lathe-type spindles or chucks. The high-frequency heating coils and the quenching equipment travel upward along the axis of the part. A hydraulic variable speed drive controls speed of ascent and descent of quench ring assembly.

Check No. 14 on Reply Card for more Details

• • •

DIE HEAD: Designated as 40AXX Landmatic, a new internal-trip type die head for threading valve seat rings up to diameters of 14¾ inches, has been developed by Landis Machine Co., Waynesboro, Pa. For thread sizes larger than 9 5/16-inch diameter an enlarged closing ring is mounted on the head to support oversize chaser holders. Varying thread lengths of different valve seat rings can be taken care of by height of oversize holders.

Check No. 15 on Reply Card for more Details

FLUID-MOTOR OPERATOR: New design of the fluid motor operator for gate valves, announced by Crane Co., Chicago 5, Ill., makes possible extensive use of motor operated valves as the actuating unit can be adapted to standard valves in stock or already installed. Motor unit, comprising motor, gear box and yoke, is bolted to valve bonnet.

Check No. 16 on Reply Card for more Details

COMPRESSION DOOR: Development of an auxiliary compression door for models 600, 275, 128 and 125 Balesters is announced by Dempster Brothers Inc., Knoxville, Tenn. Hydraulically operated door compresses heaped scrap into the charging box with a 10 to 45-ton force plus the weight of the door, ranging from 1000 to 4000 pounds.

Check No. 17 on Reply Card for more Details

CEMENT: Powerhouse finishing cement, developed by Baldwin-Hill Co., Trenton 2, N. J., is a dry, loose material of mineral wool fiber base. Suitable for indoor or outdoor application, it has low shrinkage and resists temperatures up to 1700° F and is recommended for industrial equipment such as boiler, breechings, and ductwork, oil refinery tower, vulcanizers, kilns and turbines.

Check No. 18 on Reply Card for more Details

GENERATOR: Ipsen Industries Inc., Rockford, Ill., announces a new 500 cu ft per hour endothermic generator that operates at 2150° F with a maximum input of 8 kw. It is heavily insulated for overnight idling. Instrument switch controls both power and control circuits. Unit is designed for 220 or 440 v operation.

Check No. 19 on Reply Card for more Details

HEATING TANK: Designed for melting and dispensing transformer, battery and other filled compounds requiring mechanical agitation, a new 25-gallon, electrically fired, indirectly heated tank is introduced by Aeroil Products Co., South Hackensack, N. J. Agitator is of double-bladed propeller type adjusted to 35 rpm and powered by a 1/3-hp motor with gear reduction. Special starter arrests action of agitator until material is properly heated no matter when power is turned on.

Check No. 20 on Reply Card for more Details

PHONE BOOTHS: Sound absorbing materials used in the Acousti-Booths made by Burgess-Manning Co., Libertyville, Ill., soak up the noise and permit the telephone user to hear conversations without the speaker raising his voice. Scout models are waist high; full length, doorless booths are of all wood, or steel construction.

Check No. 21 on Reply Card for more Details

SAMPLER: For quantitative sampling of airborne dusts, fumes and smokes, a new electrostatic sampler is announced by Mine Safety Appliances Co., Pittsburgh 8, Pa. It is equipped with a power pack capable of producing 10,000 to 15,000 v dc. Sampler with the sampling tube kit is furnished in a portable case.

Check No. 22 on Reply Card for more Details

SPEED REDUCER: Model No. VW-2 vertical type, double reduction speed reducer, introduced by Euclid Universal Machine Inc., Cleveland 10, O., is adapted for turntables and other vertical applications. Input capacity is ½-hp with 1000 pound-inches output torque. Capacity varies with ratio.

Check No. 23 on Reply Card for more Details

GEAR COUPLING: Compactness in the new gear coupling made by Sier-Bath Gear & Pump Co., North Bergen, N. J., is attained by the use of fewer parts. A tight fitting Neoprene seal keeps oil from leaking out. Coupling is made of forged high carbon steel and is available in ¾, 1, 1½, 2 and 2½-inch sizes.

Check No. 24 on Reply Card for more Details

DUST COLLECTOR: Improvements in model 420 Dustkop dust collector permit its use on polishing, buffing and grinding operations involving larger wheels and bigger volumes of dust. New ratings are due to the combined use of a 1/3-hp motor direct firing a new hi-static paddle wheel fan. Unit is made by Aget-Detroit Co., Ann Arbor, Mich.

Check No. 25 on Reply Card for more Details

BLOWER: Standard Stoker Co. Inc., Erie, Pa., announces a new type of positive displacement blower. Features of the blower are its quietness of operation and compactness. It is available in capacities from 100 to 15,000 cfm and for pressures up to 20 pounds.

Check No. 26 on Reply Card for more Details

WRENCH: Designated as Link-Grip, a new type multiple jaw, positive grip wrench for holding pipes and solid rounds up to 2 inches in diameter is offered by American Machine Works Inc., Racine, Wis. The serrations are milled in each of the seven links, with the handle being used for leverage only. As leverage is applied, each link in contact bites into the work surface.

Check No. 27 on Reply Card for more Details

DIFFERENTIAL DRIVE: Lift Trucks Inc., Cincinnati, O., announces use of a true differential drive on all model K front wheel drive, walkie type motorized hand lift trucks. Easy steering and economical operation are advantages of the drive.

Check No. 28 on Reply Card for more Details

DIAMOND COMPOUND: Dymo diamond compound made by Industrial Products Division, Elgin National Watch Co., Aurora, Ill., is a diamond boart combined with a synthetic vehicle to form an abrasive compound. It is soluble in commercial solvents and water and leaves no dulling film.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

DEFINITE undercurrent of strength is evidenced in the steel markets in the face of uncertainties in labor. Substantial buying by the metalworking shops over the past several weeks has not been entirely of a strike-scare character. Much of it has been of tonnage for delivery in fourth quarter when the labor relations impasse reasonably could be expected to be out of the way. The off-again on-again negotiations in the steel dispute have induced an optimistic view among fabricators. On this assumption it appears purchasers are going ahead with normal buying routine while enlarging current inventories as protection against a possible strike. Such buying policy is contributing to noticeable buoyancy in the market.

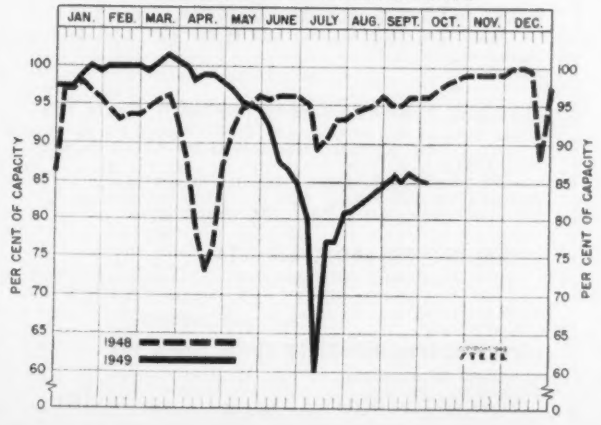
PROSPECTS—An active fourth quarter is expected in metalworking lines barring serious strike interruptions. Trade observers now think the upswing in activity which started late in the summer in certain hard goods is more than just a flash-in-the-pan. Continued improvement in demand for steel from the home appliance makers indicates further expansion in this direction. Building activity is holding up much better than expected and may continue above normal seasonal levels depending upon the weather. The long-expected decline in automotive demand has not yet appeared but likely will be felt beginning this month with auto schedules possibly falling off about 10 per cent. This slackening should not prove too serious with manufacturing activity generally improving.

DEMAND—Consumers on the average are thought holding about 30-days supply of steel. This is not excessive. Buying, consequently, should be sustained in event no interruptions due to labor trouble are experienced. Here and there consumers may be overstocked and may retire from the market, but in view of the stronger demand developing in some directions, especially for the flat-rolled products, it is not believed they will continue inactive for long. Even though automotive buying slackens this month, the steel sellers are not likely to be affected greatly since they currently are behind on shipments to many other consumers of flat-rolled products. The letup in auto requirements will provide a welcome breathing spell with tonnage freed by that industry being diverted quickly to other users. The mills are virtually sold out over the remainder of the year on cold-rolled and galvanized sheets and are rationing tonnage. Other products are freely available for fairly prompt shipment, but demand for bars has been picking up and structurals have been moving well. Noticeable protective buying of plates has been in evidence of late though sellers' backlogs are small. Merchant pig iron sales are reported improving with the foundries entertaining much larger volume of business. Little increased competition is expected in the pig iron market here from foreign iron as a result of the more favorable foreign prices due to currency devaluation. The situation, however, is being watched closely.

PRICES—STEEL's weighted index of finished steel prices holds at 152.52 while the arithmetical price average also is holding at $91.55. These compare with 151.86 and $95.05, respectively, a year ago. Price composite on steelmaking scrap rose fractionally last week, reaching $27.58 compared with $27.08 the preceding week and $43.33 a year ago. Scrap market tone continues strong but demand is sluggish with mills holding up shipments pending clarification of the labor situation. Compositions on pig iron held unchanged and compare with the like week a year ago as follows: Basic, $45.60 and $44.94; No. 2 foundry, $46.10 and $45.13; malleable, $47.27 and $45.63.

PRODUCTION—Steelmaking operations eased to 85 per cent of capacity last week, the lowest level since early in September.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Oct. 1	Change	Same Week 1948	Same Week 1947
Pittsburgh	81.5	— 2.5*	95	104
Chicago	93	— 1.5*	97	94.5
Eastern Pa.	80	None	93	91.5
Youngstown	94	None	103	92
Wheeling	91.5	— 8	93.5	81.5
Cleveland	102.5	+ 2.5*	97.5	90.5
Buffalo	79.5	None	104	88.5
Birmingham	100	None	100	99
New England	71	+ 3	84	80
Cincinnati	92	— 4	103	87
St. Louis	84.5	+ 4.5	91.5	77.5
Detroit	104	None	101	92
Western	77	— 3	..	..
Estimated national rate	85	— 1	96	94.5

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. * From revised rate.

Composite Market Averages

	Sept. 29 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	152.52	152.52	152.52	151.86	99.16
Index in cents per lb ..	4.132	4.132	4.132	4.114	2.686
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT.....	$91.55	$91.55	$91.55	$95.05	$56.73
No. 2 Fdry Pig Iron, GT	46.10	46.10	46.10	45.13	23.67
Malleable Pig Iron, GT..	47.27	47.27	47.27	45.63	24.29
Basic Pig Iron, GT.....	45.60	45.60	45.60	44.94	23.00
Steelmaking Scrap, GT..	27.58	27.08	23.58	43.33	17.16

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Sept. 29 1949	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pitts.	3.35	3.35	3.35	3.45	2.15
Bars, H.R., del. Phila. ...	3.83	3.83	3.8164	3.79	2.47
Bars, H.R., Chicago	3.35	3.35	3.35	3.35	2.15
Bars, C. F., Pitts.	3.95-4.00	3.95-4.00	3.95-4.00	3.95-4.25	2.65
Bars, C.F., Chicago	4.00	4.00	4.00	4.00	2.65
Shapes, Std., Pitts.	3.25	3.25	3.25	3.275	2.10
Shapes, Std., Chicago	3.25	3.25	3.25	3.25	2.10
Shapes, del. Phila.	3.50	3.50	3.4918	3.48	2.215
Plates, Pittsburgh	3.40	3.40	3.40	3.40-3.60	2.10
Plates, Chicago	3.40	3.40	3.40	3.40	2.10
Plates, Coatesville, Pa. ..	3.50	3.50	3.50	3.75	2.10
Plates, Sparrows Point, Md.	3.40	3.40	3.40	3.45	2.10
Plates, Claymont, Del.	3.50	3.50	3.50	3.95	2.10
Plates, del. Phila.	3.59	3.59	3.5848	3.71	2.15
Sheets, H.R., Pitts.	3.25	3.25	3.25	3.25-3.30	2.10
Sheets, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Sheets, C.R., Pitts.	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Chicago	4.00	4.00	4.00	4.00	3.05
Sheets, C.R., Detroit	4.20	4.20	4.20	4.20	3.15
Sheets, Galv., Pitts.	4.40	4.40	4.40	4.40	3.50
Strip, H.R., Pitts.	3.25	3.25	3.25	3.25-75	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25-30	2.10
Strip, C.R., Pitts.	4.00	4.00	4.00	4.00-75	2.80
Strip, C.R., Chicago	4.00-15	4.00-15	4.00-15	4.00-25	2.90
Strip, C.R., Detroit	4.20-25	4.20-25	4.20-25	4.00-50	2.90
Wire, Basic, Pitts.	4.15	4.15	4.15	4.15-4.50	2.60
Nails, Wire, Pitts.	5.15	5.15	5.15	5.15-6.30	2.55
Tin plate, box, Pitts.	$7.75	$7.75	$7.75	$6.80	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$61.00	$61.00	$61.00	$61.00	$40.00
Wire rods, 7/32-⅜", Pitts. ..	3.40	3.40	3.40	3.40	2.00

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$44-$47	$24.50
Basic, Valley	46.00	46.00	46.00	43.00	23.50
Basic, del. Phila.	49.44	49.44	49.39	50.17	25.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	43.50-46.50	24.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	43.00-43.50	24.00
No. 2 Fdry, Valley	46.50	46.50	46.50	43.50	24.00
No. 2 Fdry, del. Phila. ...	49.94	49.94	49.89	50.67	25.84
No. 2 Fdry, Birmingham ..	39.38	39.38	39.38	43.38	20.38
Malleable, Valley	46.50	46.50	46.50	43.50	24.00
Malleable, Chicago	46.50	46.50	46.50	43.50	24.00
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	62.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	148.00	135.00

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts. ..	$29.75	$29.75	$23.50	$42.75	$17.25
No. 1 Heavy Melt. E. Pa..	25.00	25.00	20.50	45.50	15.50
No. 1 Heavy Melt. Chicago	28.00	26.50	22.50	41.75	18.75
No. 1 Heavy Melt. Valley..	31.25	31.25	24.75	42.75	20.00
No. 1 Heavy Melt. Cleve...	26.50	26.50	20.00	42.25	17.00
No. 1 Heavy Melt. Buffalo.	28.25	28.25	24.25	48.25	17.50
Rails, Rerolling, Chicago..	41.50	41.50	34.50	64.50	22.25
No. 1 Cast, Chicago.....	41.50	41.50	39.00	70.50	20.00

COKE, Gross Ton

Beehive, Furn., Connlsvl. .	$13.25	$13.25	$13.25	$14.50	$7.00
Beehive, Fdry., Connlsvl. .	15.75	15.75	15.75	17.00	7.75
Oven, Fdry, Chicago	20.00	20.00	20.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	17.625	17.625	17.625	23.50	12.00
Zinc, E. St. Louis	10.00	10.00	10.00	15.00	8.25
Lead, St. Louis	14.925	14.925	14.925	19.30-35	6.35
Tin, New York	103.00	103.00	103.00	103.00	52.00
Aluminum, del.	17.00	17.00	17.00	16.50	15.00
Antimony, Laredo, Tex. ..	38.50	38.50	38.50	35.00	14.50
Nickel, refinery, duty paid	40.00	40.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark,del.	50.63	51.13	51.13	52.13
Brooklyn,N.Y.,del.	....	52.79	53.29	....
Birmingham District				
Birmingham,Ala. R2, S9	38.88	39.38	....	....
Woodward,Ala. W15	38.88	39.38	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda,N.Y. W12	46.00	46.50	47.00	....
N.Tonawanda,N.Y. T9	....	46.50	47.00	....
Boston,del.	55.26	55.76	56.20	....
Rochester,N.Y.,del.	48.63	49.13	49.63	....
Syracuse,N.Y.,del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary,Ind. C3	46.00	....	46.50	....
IndianaHarbor,Ind. I-2	46.00	....	46.50	....
So.Chicago,Ill. W14	46.00	46.50	46.50	....
So.Chicago,Ill. C3	46.00	....	46.50	47.00
So.Chicago,Ill. Y1	46.00	46.50	46.50	....
Milwaukee,del.	47.89	48.39	48.39	48.89
Muskegon,Mich.del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Lorain,O. N3	46.00	....	....	47.00
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Duluth I-3	....	....	46.50	....
Erie,Pa. I-3	46.00	46.50	46.50	47.00
Everett,Mass. E1	....	50.50	51.00	....
Geneva,Utah G1	46.00	46.50	....	....
Seattle,Tacoma,Wash.,del.	....	54.20	....	....
Portland,Oreg., del.	....	54.20	....	....
LosAngeles,SanFrancisco,del.	53.70	54.20	....	....
GraniteCity,Ill. M10	47.90	48.40	48.90	....
St.Louis,del.(incl. tax)	48.65	49.15	49.65	....
Ironton,Utah C11	46.00	46.50	....	....
LoneStar,Tex. L6	46.00	*46.50	....	....
Gulf ports,del.	50.50	51.00	....	....
Minnequa,Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	46.00	46.50	46.50	47.00
Pitts.N&S sides,Ambridge, Aliquippa,del.	47.19	47.69	47.69	48.19
McKeesRocks,del.	46.95	47.45	47.45	47.95
Lawrenceville,Homestead, McKeesport,Monaca,del.	47.44	47.94	47.94	48.44
Verona,del.	47.90	48.40	48.40	48.90
Brackenridge,del.	48.13	48.63	48.63	49.13
Bessemer,Pa. C3	46.00	....	46.50	47.00
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	....
McKeesport,Pa. N3	46.00	....	....	47.00
Sharpsville,Pa. S6	46.00	46.50	46.50	47.00
Steelton,Pa. B2	48.00	48.50	49.00	49.50
Steubenville,O. W10	46.00	....	....	....
Struthers,O. S16	46.00	....	....	....
Swedeland,Pa. A3	48.00	48.50	49.00	49.50
Philadelphia,del.	49.44	49.94	50.44	50.94
Toledo,O. I-3	46.00	46.50	46.50	47.00
Cincinnati,del.	51.01	51.51	....	....
Troy,N.Y. R2	48.00	48.50	49.00	....
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield,O.,del.	50.26	50.76	50.76	51.26

* Low phos, Southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorous: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; Add $1 for each 0.5% Si to 11.50%)

Jackson,O. J1, G2	$59.50
Buffalo H1	60.75

ELECTRIC FURNACE SIVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$71.50
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk,Iowa, OH & Fdry, 12½ lb, piglets, frt. allowed K2..	82.00
Wenatchee,Wash. OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton,Pa. B2	54.00
Philadelphia delivered	57.09
Troy,N.Y. R2	54.00

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Semifinished and Finished Steel Products

Closing prices Sept. 29, 1949; cents per lb. unless otherwise noted. Code numbers following mill points indicate producing company, key on next page.

INGOTS, Carbon, Forging (NT)

Detroit R7 ..... $50.00
Munhall,Pa. C3 ..... 50.00

INGOTS, Alloy (NT)

Detroit R7 ..... $51.00
Houston,Tex. S5 ..... 59.00
Midland,Pa. C18 ..... 51.00
Munhall,Pa. C3 ..... 51.00
So.Duquesne,Pa. C3 ... 51.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Bessemer,Pa. C3 ..... $52.00
Clairton,Pa. C3 ..... 52.00
Conshohocken,Pa. A3 .. 57.00
Ensley,Ala. T2 ..... 52.00
Fairfield,Ala. T2 ..... 52.00
Fontana,Calif. K1 .... 71.00
Gary,Ind. C3 ..... 52.00
Johnstown,Pa. B2 .... 52.00
Lackawanna,N.Y. B2 .. 52.00
Munhall,Pa. C3 ..... 52.00
Sharon,Pa. S3 ..... 52.00
So.Chicago,Ill. C3 .... 52.00
So.Duquesne,Pa. C3 ... 52.00

Carbon, Forging (NT)

Bessemer,Pa. C3 ..... $61.00
Buffalo R2 ..... 61.00
Canton,O. R2 ..... 61.00
Clairton,Pa. C3 ..... 61.00
Cleveland R2 ..... 61.00
Conshohocken,Pa. A3 .. 63.00
Detroit R7 ..... 61.00
Ensley,Ala. T2 ..... 61.00
Fairfield,Ala. T2 ..... 61.00
Fontana,Calif. K1 .... 80.00
Gary,Ind. C3 ..... 61.00
Geneva,Utah G1 ..... 61.00
Houston,Tex. S5 ..... 69.00
Ind.Harbor,Ind. I-2 ... 61.00
Johnstown,Pa. B2 .... 61.00
Lackawanna,N.Y. B2 .. 61.00
Munhall,Pa. C3 ..... 61.00
So.Duquesne,Pa. C3 .. 61.00
So.Chicago,Ill. C3, R2.. 61.00
Warren,O. C17 ..... 61.00

Alloy (NT)

Bethlehem,Pa. B2 .... $63.00
Buffalo R2 ..... 63.00
Canton,O. R2, T7 .... 63.00
Conshohocken,Pa. A3 .. 65.00
Detroit R7 ..... 63.00
Fontana,Calif. K1 .... 82.00
Gary,Ind. C3 ..... 63.00
Houston,Tex. S5 ..... 71.00
Johnstown,Pa. B2 .... 63.00
Lackawanna,N.Y. B2 .. 63.00
Massillon,O. R2 ..... 63.00
Midland,Pa. C18 ..... 63.00
Munhall,Pa. C3 ..... 63.00
Sharon,Pa. S3 ..... 63.00
So.Chicago,Ill. C3, R2.. 63.00
So.Duquesne,Pa. C3 ... 63.00
Warren,O. C17 ..... 63.00

SHEET BARS (NT)

Mansfield,O. E6..(GT) $60.00
Portsmouth,O. P12 .... 52.00
Sharon,Pa. S3 ..... 52.00

ROUNDS, SEAMLESS TUBE (NT)

Canton,O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Ind.Harbor,Ind. I-2 .... 76.00
Massillon,O. R2 ..... 76.00
So.Chicago,Ill. R2 .... 76.00

SKELP

Aliquippa,Pa. J5 ..... 3.25
Munhall,Pa. C3 ..... 3.25
Warren,O. R2 ..... 3.25
Youngstown C3, R2 .... 3.25

WIRE RODS

AlabamaCity,Ala. R2 .. 3.40
Cleveland A7 ..... 3.40
Donora,Pa. A7 ..... 3.40
Fairfield,Ala. T2 ..... 3.40
Houston,Tex. S5 ..... 3.95
Ind.Harbor,Ind. Y1 .... 3.40
Johnstown,Pa. B2 .... 3.40
Joliet,Ill. A7 ..... 3.40
LosAngeles B3 ..... 4.20
Monessen,Pa. P7 .... 3.40
Pittsburg,Calif. C11 ... 4.05
Portsmouth,O. P12 .... 3.40
So.Chicago,Ill. R2 .... 3.40
SparrowsPoint B2 .... 3.50
Sterling,Ill.(1) N15 .... 3.40
Struthers,O. Y1 ..... 3.40
Torrance,Calif. C11 .... 4.20
Worcester,Mass. A7 .... 3.70

STRUCTURALS

Wide Flange

Bethlehem,Pa. B2 ..... 3.30
Lackawanna,N.Y. B2 .. 3.30
Munhall,Pa. C3 ..... 3.30
So.Chicago,Ill. C3 ..... 3.20

H.-S. Low-Alloy

Aliquippa,Pa. J5 ..... 4.95
Bessemer,Ala. T2 ..... 4.95
Bethlehem,Pa.(14) B2 .. 5.05
Clairton,Pa. C3 ..... 4.95
Fairfield,Ala. T2 ..... 4.95
Fontana,Calif. K1 .... 6.10
Gary,Ind. C3 ..... 4.95
Ind.Harbor,Ind. I-2, Y1 4.95
Johnstown,Pa. B2 ..... 5.05
Lackawanna,N.Y. B2 ... 5.05
Munhall,Pa.(14) C3 .... 4.95
So.Chicago,Ill.(14) C3 .. 4.95
Struthers,O. Y1 ..... 4.95

Carbon Steel Stand. Shapes

Aliquippa,Pa. J5 ..... 3.25
Bessemer,Ala. T2 ..... 3.25
Bethlehem,Pa. B2 ..... 3.30
Clairton,Pa. C3 ..... 3.25
Fairfield,Ala. T2 ..... 3.25
Fontana,Calif. K1 .... 3.80
Gary,Ind. C3 ..... 3.25
Geneva,Utah G1 ..... 3.25
Houston,Tex. S5 ..... 3.65
Ind.Harbor,Ind. I-2 .... 3.25
Johnstown,Pa. B2 ..... 3.30
KansasCity,Mo. S5 .... 3.85
Lackawanna,N.Y. B2 ... 3.30
LosAngeles B3 ..... 3.85
Minnequa,Colo. C10 .... 3.75
Munhall,Pa. C3 ..... 3.25
Niles,Calif.(22) P1 .... 3.97
Seattle B3 ..... 3.90
So.Chicago,Ill. C3, W14 .. 3.25
So.SanFrancisco B3 .... 3.80
Torrance,Calif. C11 .... 3.85
Weirton,W.Va. W6 .... 3.25

Alloy Stand. Shapes

Clairton,Pa. C3 ..... 4.05
Fontana,Calif. K1 ..... 5.25
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 .... 4.05

SHEET STEEL PILING

Ind.Harbor,Ind. I-2 ..... 4.05
Lackawanna,N.Y. B2 .... 4.05
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 ..... 4.05
Weirton,W.Va. W6 ..... 4.05

PLATES Carbon Steel

AlabamaCity,Ala. R2 ... 3.40
Aliquippa,Pa. J5 ..... 3.40
Ashland,Ky.(15) A10 .... 3.40
Bessemer,Ala. T2 ..... 3.40
Clairton,Pa. C3 ..... 3.40
Claymont,Del. W16 .... 3.50
Cleveland J5, R2 ..... 3.40
Coatesville,Pa. L7 ..... 3.50
Conshohocken,Pa. A3 ... 3.50
Ecorse,Mich. G5 ..... 3.65
Fairfield,Ala. T2 ..... 3.40
Fontana,Calif. K1 ..... 4.00
Gary,Ind. C3 ..... 3.40
Geneva,Utah G1 ..... 3.40
Harrisburg,Pa. C5 ..... 3.50
Houston,Tex. S5 ..... 3.80
Ind.Harbor,Ind. I-2, Y1 .3.40
Johnstown,Pa. B2 ..... 3.40
Lackawanna,N.Y. B2 ... 3.40
Minnequa,Colo. C10 .... 4.30
Munhall,Pa. C3 ..... 3.40
Pittsburgh J5 ..... 3.40
Seattle B3 ..... 4.30
Sharon,Pa. S3 ..... 3.40
So.Chicago,Ill. C3, W14 .3.40
SparrowsPoint,Md. B2 .. 3.40
Steubenville,O. W10 .... 3.40
Warren,O. R2 ..... 3.40
Weirton,W.Va. W6 ..... 3.40
Youngstown C3, Y1 .... 3.40

PLATES (Universal Mill)

Fontana,Calif. K1 ..... 4.30

PLATES, Open-Hearth Alloy

Coatesville,Pa. L7 ..... 4.50
Conshohocken,Pa. A3 .. 4.40
Fontana,Calif. K1 ..... 5.40
Gary,Ind. C3 ..... 4.40
Johnstown,Pa. B2 ..... 4.40
Munhall,Pa. C3 ..... 4.40
Sharon,Pa. S3 ..... 4.40
So.Chicago,Ill. C3 .... 4.40
SparrowsPoint,Md. B2 .. 4.40

PLATES, Ingot Iron

Ashland,cl(15) A10 .... 3.65
Ashland,lcl(15) A10 .... 4.15
Cleveland,cl R2 ..... 3.65
Warren,O.,cl R2 ..... 3.65

PLATES, Wrought Iron

Economy,Pa. B14 ..... 7.85

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 5.20
Bessemer,Ala. T2 ..... 5.20
Clairton,Pa. C3 ..... 5.20
Cleveland J5, R2 ..... 5.20
Conshohocken,Pa. A3 ... 5.20
Ecorse,Mich. G5 ..... 5.45
Fairfield,Ala. T2 ..... 5.20
Fontana,Calif. K1 ..... 5.80
Gary,Ind. C3 ..... 5.20
Geneva,Utah G1 ..... 5.20
Houston,Tex. S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 .5.20
Johnstown,Pa. B2 ..... 5.20
Munhall,Pa. C3 ..... 5.20
Pittsburgh J5 ..... 5.20
Sharon,Pa. S3 ..... 5.65
So.Chicago,Ill. C3 ..... 5.20
SparrowsPoint,Md. B2 .. 5.20
Warren,O. R2 ..... 5.20
Youngstown Y1 ..... 5.20

FLOOR PLATES

Cleveland J5 ..... 4.55
Conshohocken,Pa. A3 ... 4.55
Harrisburg,Pa. C5 ..... 4.55
Ind.Harbor,Ind. I-2 .... 4.55
Munhall,Pa. C3 ..... 4.55
So.Chicago,Ill. C3 ..... 4.55

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2 ... 3.35
Aliquippa,Pa. J5 ..... 3.35
Alton,Ill.(1) L1 ..... 3.35
Ashland,Ky.(17) A10 .. 3.35
Atlanta,Ga. A11 ..... 3.50
Bessemer,Ala. T2 ..... 3.35
Buffalo R2 ..... 3.35
Canton,O. R2 ..... 3.35
Clairton,Pa. C3 ..... 3.35
Cleveland R2 ..... 3.35
Ecorse,Mich. G5 ..... 3.55
Emeryville,Calif. J7 .... 4.10
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 ..... 4.00
Gary,Ind. C3 ..... 3.35
Houston,Tex. S5 ..... 3.75
Ind.Harbor,Ind. I-2, Y1 . 3.35
Johnstown,Pa. B2 ..... 3.35
KansasCity,Mo. S5 ..... 3.95
Lackawanna,N.Y. B2 ... 3.35
LosAngeles B3 ..... 4.05
Midland,Pa. C18 ..... 3.35
Milton,Pa. B6 ..... 3.35
Minnequa,Colo. C10 .... 3.85
Niles,Calif. P1 ..... 4.05
N.Tonawanda,N.Y. B11 .3.35
Pittsburg,Calif. C11 .... 4.05
Pittsburgh J5 ..... 3.35
Portland,Oreg. O4 ..... 4.10
Seattle B3, N14 ..... 4.10
S.Chicago C3, R2, W14 .. 3.35
So.Duquesne,Pa. C3 .... 3.35
S.SanFran.,Cal. B3 .... 4.10
Struthers,O. Y1 ..... 3.35
Torrance,Calif. C11 .... 4.05
Weirton,W.Va. W6 .... 3.35
Youngstown C3, R2 .... 3.35

BARS, Cold-Finished Carbon

Aliquippa,Pa. K5 ..... 4.00
Ambridge,Pa. W18 ..... 4.00
BeaverFalls, M12, R2 .. 4.00
Buffalo B5 ..... 4.00
Camden,N.J. P13 ..... 4.48
Carnegie,Pa. C12 ..... 4.00
Chicago W18 ..... 4.00
Cleveland A7, C20 ..... 4.00
Cumberland,Md. C19 ... 3.95
Donora,Pa. A7 ..... 4.00
Ecorse,Mich. G5 ..... 4.30
Elyria,O. W8 ..... 4.00
FranklinPark,Ill. N5 .... 4.00
Gary,Ind. R2 ..... 4.00
Hammond,Ind. L2, M13.. 4.00
Hartford,Conn. R2 ..... 4.40
Harvey,Ill. B5 ..... 4.00
Indianapolis M13 ..... 4.20
LosAngeles R2 ..... 5.40
Mansfield,Mass. B5 .... 4.40
Massillon,O. R2 ..... 4.00
Midland,Pa. C18 ..... 4.00
Monaca,Pa. S17 ..... 4.00
Newark,N.J. W18 ..... 4.40
Plymouth,Mich. P5 .... 4.25
Pittsburgh J5 ..... 3.95
Putnam,Conn. W18 .... 4.40
Readville,Mass. C14 .... 4.40
St.Louis,Mo. M5 ..... 4.35
So.Chicago,Ill. W14 .... 4.00
SpringCity,Pa.(5) K3 .. 4.48
Struthers,O. Y1 ..... 4.00
Waukegan,Ill. A7 ..... 4.00
Youngstown F3, Y1 .... 4.00

BAR SIZE ANGLES; S. SHAPES

Aliquippa,Pa. J5 ..... 3.35
Atlanta,Ga. A11 ..... 3.50
Bethlehem,Pa.(2) B2 .. 3.55
Johnstown,Pa. B2 ..... 3.35
Lackawanna,N.Y. B2 .. 3.35
Niles,Calif. P1 ..... 4.05
Pittsburgh J5 ..... 3.35
Portland,Oreg. O4 ..... 3.90
SanFrancisco S7 ..... 4.05
Weirton,W.Va. W6 ..... 3.35

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. C3 ..... 4.00
Fontana,Calif. K1 ..... 4.75
Gary,Ind. C3 ..... 4.00
Youngstown C3 ..... 4.00

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 5.10
Bessemer,Ala. T2 ..... 5.10
Bethlehem,Pa. B2 ..... 5.10
Clairton,Pa. C3 ..... 5.10
Cleveland R2 ..... 5.10
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.10
Fontana,Calif. K1 ..... 6.15
Gary,Ind. C3 ..... 5.10
Ind.Harbor,Ind. I-2, Y1 .. 5.10
Johnstown,Pa. B2 ..... 5.10
Lackawanna,N.Y. B2 ... 5.10
Pittsburgh J5 ..... 5.10
So.Duquesne,Pa. C3 .... 5.10
Struthers,O. Y1 ..... 5.10
Youngstown C3 ..... 5.10

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ..... 3.75
Buffalo R2 ..... 3.75
Canton,O. R2, T7 ..... 3.75
Clairton,Pa. C3 ..... 3.75
Ecorse,Mich. G5 ..... 4.05
Fontana,Calif. K1 ..... 4.75
Gary,Ind. C3 ..... 3.75
Houston,Tex. S5 ..... 4.15
Ind.Harbor,Ind. I-2, Y1 .. 3.75
Johnstown,Pa. B2 ..... 3.75
KansasCity,Mo. S5 ..... 4.35
Lackawanna,N.Y. B2 ... 3.75
LosAngeles B3 ..... 4.80
Massillon,O. R2 ..... 3.75
Midland,Pa. C18 ..... 3.75
S.Chicago C3, R2, W14 .. 3.75
So.Duquesne,Pa. C3 .... 3.75
Struthers,O. Y1 ..... 3.75
Warren,O. C17 ..... 3.75
Youngstown C3 ..... 3.75

BARS, Cold-Finished Alloy

Aliquippa,Pa. K5 ..... 4.65
Ambridge,Pa. W18 ..... 4.65
BeaverFalls,Pa. M12 .... 4.65
Bethlehem,Pa. B2 ..... 4.65
Buffalo B5 ..... 4.65
Canton,O. R2, T7 ..... 4.65
Carnegie,Pa. C12 ..... 4.65
Chicago W18 ..... 4.65
Cleveland A7, C20 ..... 4.65
Donora,Pa. A7 ..... 4.65
Elyria,O. W8 ..... 4.65
Gary,Ind. R2 ..... 4.65
Hammond,Ind. L2, M13 .. 4.65
Hartford,Conn. R2 ..... 4.95
Harvey,Ill. B5 ..... 4.65
Indianapolis M13 ..... 4.85
Lackawanna,N.Y. B2 .... 4.65
Mansfield,Mass. B5 .... 4.95
Massillon,O. R2 ..... 4.65
Midland,Pa. C18 ..... 4.65
Monaca,Pa. S17 ..... 4.65
Newark,N.J. W18 ..... 4.95
So.Chicago,Ill. R2, W14 .4.65
Struthers,O. Y1 ..... 4.65
Waukegan,Ill. A7 ..... 4.65
Worcester,Mass. A7 .... 4.95
Youngstown F3, Y1 .... 4.65

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2 ... 3.35
Alton,Ill.(6) L1 ..... 3.35
Atlanta,Ga.(7) A11 .... 3.50
Buffalo R2 ..... 3.35
Cleveland R2 ..... 3.35
Emeryville,Calif. J7 .... 4.10
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 ..... 4.00
Ft.Worth,Tex.(7) T4 .... 4.33
Gary,Ind. C3 ..... 3.35
Houston,Tex. S5 ..... 3.75
Ind.Harbor,Ind. I-2, Y1 .. 3.35
Johnstown,Pa. B2 ..... 3.35
KansasCity,Mo. S5 ..... 3.95
Lackawanna,N.Y. B2 ... 3.35
LosAngeles B3 ..... 4.05
Minnequa,Colo. C10 .... 4.25
Niles,Calif. P1 ..... 4.05
Pittsburg,Calif. C11 .... 4.05
Pittsburgh J5 ..... 3.35
Portland,Oreg. O4 ..... 4.10
Seattle,Wash. B3, N14 .. 4.10
So.Chicago,Ill. R2 ..... 3.35
So.Duquesne,Pa. C3 .... 3.35
So.SanFrancisco B3 .... 4.10
SparrowsPoint,Md. B2 .. 3.35
Struthers,O. Y1 ..... 3.35
Torrance,Calif. C11 .... 4.05
Youngstown C3, R2 .... 3.35

BARS, Reinforcing (Fabricated; to Consumers)

Ft.Worth,Tex.(7) T4 .... 4.83
Johnstown,¾-1" B2 .... 4.25
LosAngeles B3 ..... 5.00
Pittsburgh J5 ..... 4.25
Seattle B3, N14 ..... 5.00
So.SanFrancisco B3 .... 5.00
SparrowsPt.,1⅜-1¾" B2 . 4.83
SparrowsPt.,¾-1" B2 .. 4.25

RAIL STEEL BARS

ChicagoHts.,Ill.(3) I-2 .. 3.25
Hntngtn,W.Va.(3,4) W7 . 3.35
Moline,Ill.(3) R2 ..... 3.35
Williamsport(2,3) S19 .. 3.35
Williamsport(4) S19 .... 3.85

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 .. 9.50
Economy,Pa.(D.R.)B14 . 11.00
Economy(Stablt) B14 .. 11.30
McK.Rks.(S.R.) L5 .... 8.60
McK.Rks.(D.R.) L5 .... 11.25
McK.Rks.(Staybolt) L5 . 12.75

BARS, Hot-Rolled Ingot Iron

Ashland,Ky.(17) A10 .. 3.60

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2 .. 3.25
Ashland,Ky.(8) A10 .... 3.25
Butler,Pa. A10 ..... 3.25
Cleveland J5, R2 ..... 3.25
Conshohocken,Pa. A3 .. 3.35
Ecorse,Mich.(8) G5 .... 3.45
Fairfield,Ala. T2 ..... 3.25
Fontana,Calif. K1 ..... 4.15
Gary,Ind. C3 ..... 3.25
Ind.Harbor,Ind. I-2, Y1 .. 3.25
Irvin,Pa. C3 ..... 3.25
KansasCity,Mo. S5 ..... 6.25
Kokomo,Ind. C16 ..... 3.35
Lackawanna,N.Y. B2 .... 3.25
Munhall,Pa. C3 ..... 3.25
Pittsburg,Calif. C11 .... 3.95
Pittsburgh J5 ..... 3.25
Sharon,Pa. S3 ..... 3.25
So.Chicago,Ill. W14 .... 3.25
SparrowsPoint,Md. B2 .. 3.25
Steubenville,O. W10 .... 3.25
Torrance,Calif. C11 .... 3.95
Warren,O. R2 ..... 3.25
Weirton,W.Va. W6 .... 3.25
Youngstown C3, Y1 .... 3.25

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)

AlabamaCity,Ala. R2 .... 4.40
Dover,O. R1 ..... 5.00
Fairfield,Ala. T2 ..... 4.15
Ind.Harbor,Ind. I-2 .... 4.15
Kokomo,Ind. C16 ..... 4.25
Mansfield,O. E5 ..... 4.15
Niles,O. N12, M4 ..... 4.15
Torrance,Calif. C11 .... 5.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 ..... 4.00
Cleveland J5 R2 ..... 4.00
Ecorse,Mich. G5 ..... 4.20
Fairfield,Ala. T2 ..... 4.00
Follansbee,W.Va. F4 .... 4.00
Fontana,Calif. K1 ..... 4.90
Gary,Ind. C3 ..... 4.00
GraniteCity,Ill. G4 ..... 4.20
Ind.Harbor,Ind. I-2, Y1 .. 4.00
Irvin,Pa. C3 ..... 4.00
Lackawanna,N.Y. B2 .... 4.00
Middletown,O. A10 ..... 4.00
Pittsburg,Calif. C11 .... 4.95
Pittsburgh J5 ..... 4.00
SparrowsPoint,Md. B2 .. 4.00
Steubenville,O. W10 .... 4.00
Warren,O. R2 ..... 4.00
Weirton,W.Va. W6 ..... 4.00
Youngstown Y1 ..... 4.00

SHEETS, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5, R2 ..... 6.05
Ecorse,Mich. G5 ..... 6.25
Fontana,Calif. K1 ..... 6.95
Gary,Ind. C3 ..... 6.05
Ind.Harbor,Ind. I-2, Y1 .. 6.05
Irvin,Pa. C3 ..... 6.05
Lackawanna,N.Y. B2 .... 6.05
Pittsburgh J5 ..... 6.05
Sharon,Pa. S3 ..... 6.05
SparrowsPoint,Md. B2 .. 6.05
Warren,O. R2 ..... 6.05
Weirton,W.Va. W6 .... 6.05
Youngstown Y1 ..... 6.05

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy

Cleveland J5, R2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Calif. K1	6.64
Gary,Ind. C3	4.95
Ind.Harbor,Ind. I-2, Y1	4.95
Irvin,Pa. C3	4.95
Lackawanna,N.Y. B2	4.95
Pittsburgh J5	4.95
Sharon,Pa. S3	4.95
So.Chicago, Ill. C3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

SHEETS, Gal'zd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	5.40
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.40
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. C3	6.75
SparrowsPoint,Md. B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	4.95

SHEETS, Zincgrip No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2	5.15
Niles,O. R2	5.15
Weirton,W.Va. W6	5.00

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Culvert, No. 16 Flat

	Cu Alloy	Cu FE
Ashland A10	5.00	...
Fairfield,Ala. T2	...	5.00
Gary C3	5.00	5.35
GraniteCity G4	5.40	5.70
Irvin C3	5.00	5.35
Kokomo C16	5.40	...
MartinsFy,O. W10	5.00	5.35
Pittsburg,Cal. C11	5.75	...
SparrowsPt. B2	5.00	...
Torrance,Cal. C11	5.75	...

SHEETS, Culvert, No. 16 Flat Ingot Iron

Ashland,Ky. A10	5.25

SHEETS, Well Casing

Torrance,Calif. C11	4.75
Youngstown C3	3.75

SHEETS, Aluminized

Butler,Pa. A10	7.75

SHEETS, Long Terne, Steel (No. 10; Commercial Quality)

BeechBotm.,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Weirton,W.Va. W6	4.80

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.75
Gary,Ind. C3	6.65
Ind.Harbor,Ind. I2	6.65
Irvin,Pa. C3	6.65
Weirton,W.Va. W6	6.65
Yorkville,O. W10	6.65

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.20

SHEETS, Mfg. Ternes, 8 lb

Yorkville,O. W.10	$8.10
Gary,Ind. C3	8.10

SHEETS, Coated Ternes, 12 lb

Yorkville,O. W10	8.95

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.50
Cleveland R2	3.85
Ind.Harbor,Ind. I2	3.50
Warren,O. R2	3.85

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.60
Middletown,O. A10	4.50
Warren,O. R2	4.60

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I2	4.95

SHEETS, Zincgrip No. 10 Flat, Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron, No. 12

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.40
Youngstown Y1	4.40

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.75
Fairfield,Ala. T2	5.85
Gary,Ind. C3	5.75
GraniteCity,Ill. G4	5.95
Ind.Harbor,Ind. I2, Y1	5.75
Irvin,Pa. C3	5.75
Niles,O. R2	5.75
Pittsburg,Calif. C11	6.50
SparrowsPoint,Md. B2	5.85
Warren,O. R2	5.75
Weirton,W.Va. W6	5.75
Yorkville,O. W10	5.75

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.50	$7.75
Fairfield,Ala. T2	7.60	7.85
Gary C3	7.50	7.75
Gran.City.,Ill G4	7.70	7.95
Ind.Harb. I2, Y1	7.50	7.75
Irvin,Pa. C3	7.50	7.75
Pitts.,Cal. C11	8.25	8.50
Sp.Pt.,Md. B2	7.60	7.85
Warren R2	7.50	7.75
Weirton W6	7.50	7.75
Yorkville,O. W10.	7.50	7.75

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. A10	3.50
Warren,O. R2	3.85

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.60

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky. A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.25
Cleveland J5	3.25
Detroit M1	3.45
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.25
N.Tonawanda,N.Y. B11	3.30
Pittsburg,Calif. C11	4.00
Pittsburgh J5	3.25
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.25
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Hot-Rolled Alloy

Bridgeprt.Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn.Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Cold-Rolled Alloy Steel

Bridgeprt.Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.80
NewBritn.Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Carbon

Berea,O. C7	6.10
Bridgeprt,Conn.(10) S15	4.00
Butler,Pa. A10	4.00
Chicago,Ill. T6	4.15
Cleveland A7, J5	4.00
Detroit D2, D3	4.25
Detroit M1	4.20
Dover,O. G6	4.00
Ecorse,Mich. G5	4.20
Follansbee,W.Va. F4	4.00
Fontana,Calif. K1	4.90
Ind.Harbor,Ind. I2	4.00
Lackawanna,N.Y. B2	4.00
LosAngeles C1	5.00
Mattapan,Mass.(21) T6	4.50
Middletown,O. A10	4.00
NewBritain(10) S15	4.00
NewCastle,Pa. B4, E5	4.00
NewHaven,Conn. A7, D2	4.50
NewKensington,Pa. A6	4.00
NewYork W3	5.00
Pawtucket,R.I.(11) N8	4.55
Pawtucket,R.I.(21) N8	4.50
Pawtucket,R.I. R3	4.50
Pittsburgh J5	4.00
Riverdale,Ill. A1	4.15
Sharon,Pa. S3	4.00
SparrowsPoint,Md. B2	4.00
Trenton,N.J.(13) R5	4.50
Wallingford,Conn. W2	4.50
Warren,O. R2, T5	4.00
Weirton,W.Va. W6	4.00
Youngstown C8, Y1	4.00

STRIP, Cold-Rolled, High-strength Low-Alloy

Cleveland A7, J5	6.05
Dover,O. G6	6.05
Ecorse,Mich. G5	6.25
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.05
Pittsburgh J5	6.05
Sharon,Pa. S3	6.05
SparrowsPoint,Md. B2	6.05
Warren,O. R2	6.05
Weirton,W.Va. W6	6.05
Youngstown Y1	6.05

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.00

TIN PLATE, Electrolytic (Base Box)

	0.25 lb.	0.50 lb.	0.75 lb.
Aliquippa,Pa. J5	$6.45	$6.70	$7.00
Fairfield,Ala. T2	6.55	6.80	7.10
Gary,Ill. C3	6.45	6.70	7.00
GraniteCity,Ill. G4	6.65	6.90	7.20
Ind.Harbor,Ind. I2, Y1	6.45	6.70	7.00
Irvin,Pa. C3	6.45	6.70	7.00
Niles,O. R2	6.45	6.70	7.00
Pittsburg,Calif. C11	7.20	7.45	7.75
SparrowsPoint,Md. B2	6.55	6.80	7.10
Weirton,W.Va. W6	6.45	6.70	7.00
Yorkville,O. W10	6.45	6.70	7.00

SHEETS SILICON, (24 Gage Base)

	Field	Arm.	Elec.	Motor	Dyn.
BeechBottom,W.Va. W10	...	5.45	5.95	6.70	7.50
Brackenridge,Pa. A4	...	...	5.95	6.70	7.50
Follansbee,W.Va. F4	...	5.45	5.95	6.70	7.50
GraniteCity,Ill. G4	...	...	6.15	6.90	7.70
Ind.Harbor,Ind. I2	5.15	5.45	5.95	...	...
Mansfield,O. E6	5.15	5.45	5.95	...	...
Niles,O. M4	5.15	5.45	5.95	...	...
Niles,O. N12	...	5.45	5.95	...	...
Toronto,O. F4	...	5.45	5.95	6.70	7.50
Vandergrift,Pa. C3	...	5.45	5.95	6.70	7.50
Warren,O. R2	...	5.45	5.95	6.70	...
Zanesville,O. A10	...	5.45	5.95	6.70	7.50

COILS AND CUT LENGTHS, Cold-Rolled, Silicon

	Field	Arm.	Elec.	Motor	Dyn.
Vandergrift,Pa. C3	...	5.70	6.20	6.95	7.75
Warren,O. R2	5.40	5.70	6.20	6.95	7.75

SHEETS, Silicon Transformer Grade

	72	65	58	52
BeechBottom,W.Va. W10	8.05	8.60	9.30	10.10
Brackenridge,Pa. A4	8.05	8.60	9.30	....
Follansbee,W.Va. F4	8.05	8.60	9.30	10.10
Toronto,O. F4	8.05	8.60	9.30	10.10
Vandergrift,Pa. C3	8.05	8.60	9.30	10.10
Zanesville,O. A10	8.05	8.60	9.30	10.10

COLD-REDUCED COILS and Cut Lengths, Silicon

	72	T-100	T-90	T-80
Butler,Pa. A10	...	12.35	13.60	14.85
Vandergrift,Pa. C3	8.30	11.35	12.60	13.85
Warren,O. R2	8.30	....	....	....

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.25-0.40C	0.40-0.60C	0.60-0.80C	0.80-1.05C	1.05-1.35C
Bridgeprt,Conn.(10) S15	4.00	5.50	6.10	8.05	10.35
Bristol,Conn. W1	...	...	6.40	8.35	...
Carnegie,Pa. S18	...	5.50	6.10	8.05	10.35
Chicago T6	4.25	5.65	6.25	8.20	10.50
Cleveland A7	4.00	5.50	6.10	8.05	10.35
Dover,O. G6	4.00	5.50	6.10	7.85	10.15
Harrison,N.J. C18	...	...	6.40	8.35	10.65
Mattapan,Mass. T6	4.50	5.80	6.40	8.35	10.65
NewBritn.,Conn.(19) S15	4.00	5.50	6.10	8.05	10.35
NewCastle,Pa. B4	4.00	5.50	6.10	...	...
NewYork W3	...	5.80	6.40	8.35	10.65
Pawtucket,R.I. N8					
Cleve.orPitts.Base	4.55	5.50	6.10	8.05	10.35
Worcester,Mass.Base	4.50	5.80	6.40	8.35	10.65
Sharon,Pa. S3	4.00	5.50	6.10	8.05	10.35
Trenton,N.J. R5	...	5.80	6.40	8.35	10.65
Union,N.J. H6	4.40	6.35	6.35	8.30	10.50
Wallingford,Conn. W2	4.50	5.80	6.40	8.35	10.65
Weirton,W.Va. W6	4.00	5.50	6.10	8.05	10.35
Worcester,Mass. A7	4.30	5.80	6.40	8.35	10.65
Worcester,Mass. T6	4.50	5.80	6.40	8.35	10.65
Youngstown C8	4.50	5.50	6.10	8.05	10.35

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel Co.
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.

C1 Calif. Cold-Rolled Steel
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cld. Roll. Mills Co.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Col. Steel & Shafting Co.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Co.
D4 Disston & Sons, Henry

E1 Eastrn. Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Co.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F6 Fretz-Moon Tube Co.

G1 Geneva Steel Co.
G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.
H6 Hind Steel Co. Inc

I1 Igoe Bros. Inc.
I2 Inland Steel Co.
I3 Interlake Iron Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J7 Judson Steel Corp.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	4.95
Cleveland J5	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Calif. K1	6.64
Gary,Ind. C3	4.95
Ind.Harbor,Ind. I2, Y1	4.95
Lackawanna,N.Y. B2	4.95
Pittsburgh J5	4.95
Sharon,Pa. S3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

TIGHT COOPERAGE HOOP

Atlanta A11	3.60
Riverdale,Ill. A1	3.60
Sharon,Pa. S3	3.60
Youngstown C3	3.60

WIRE, MB Spring, High-Carbon

Aliquippa,Pa J5	5.55
Alton,Ill.(1) L1	5.55
Bartonville,Ill.(19) K4	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Fostoria,O. S1	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7	5.55
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Trenton,N.J. A7, R5	5.85
Waukegan,Ill. A7	5.55
Worcester A7,J4,T6,W12	5.85

WIRE, Cold-Rolled Flat

Chicago T6	5.35
Cleveland A7	5.00
Dover,O. G6	5.00
Fostoria,O. S1	5.00
Kokomo,Ind. C16	5.00
Monessen,Pa. P7	5.00
Pawtucket,R.I.(11) N8	5.55
Pawtucket,R.I.(12) N8	5.50
Trenton,N.J. R5	5.30
Worcester,Mass. A7	5.30
Worcester,Mass. T6	5.30

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(19) K4	7.70
Chicago W13	7.70
Cleveland A7	7.70
Fostoria,O. S1	7.70
Johnstown,Pa. B2	7.70
Kokomo,Ind. C16	7.70
Portsmouth,O. P12	7.70
Struthers,O. Y1	7.70
Trenton,N.J. R5	8.00
Waukegan,Ill. A7	7.70
Worcester,Mass. A7, T6	8.00

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.15
Aliquippa,Pa J5	4.15
Alton,Ill.(1) L1	4.15
Bartonville,Ill.(1) K4	4.15
Buffalo W12	4.15
Chicago W13	4.15
Cleveland A7, C20	4.15
Crawfrdsvll,Ind. M8	4.30
Donora,Pa. A7	4.15
Duluth A7	4.15
Fairfield,Ala. T2	4.15
Fostoria,O.(24) S1	4.50
Houston,Tex. S5	4.55
Johnstown,Pa. B2	4.15
Joliet,Ill. A7	4.15
KansasCity,Mo. S5	4.75
Kokomo,Ind. C16	4.25
LosAngeles B3	5.10
Millbury,Mass.(12) N6	4.45
Minnequa,Colo. C10	4.50
Monessen,Pa. P7	4.15
Newark,6-8ga. I1	4.75
No.Tonawanda B11	4.18
Palmer,Mass. W12	4.45
Pittsburg,Calif. C11	5.10
Portsmouth,O. P12	4.15
Rankin,Pa. A7	4.15
So.Chicago,Ill. R2	4.15
So.SanFrancisco C10	5.10
SparrowsPoint,Md. B2	4.25
Sterling,Ill.(1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	5.10
Waukegan,Ill. A7	4.15
Worcester,Mass. A7, T6	4.45

WIRE (16 gage)	An'ld. Stone	Galv. Stone
Aliquippa J5	9.05	10.55
Bartnvill,Ill.19 K4	9.05	10.55
Cleve. A7	9.05	10.55
Fostoria,O. S1	9.15	10.65
Johnstwn B2	9.05	10.55
Kokomo C16	9.05	10.10
Minnequa C10	9.40	10.90
Pitts.Cal. C11	9.40	10.90
Prtsmth.(18) P12	9.05	10.55
Sp.Pt., B2	9.15	10.65
Struthers Y1	9.05	10.55
Waukegan A7	9.05	10.55

WIRE, Merchant Quality (6 to 8 gage)

	An'ld.	Galv.
Ala.City, R2	4.80	5.25
Aliquippa J5	4.80	5.25
Atlanta A11	4.95	5.40
Bartnville.(19) K4	4.80	5.25
Cleveland A7	4.80	5.25
Crawfrdsvll. M8	4.95	5.40
Donora A7	4.80	5.25
Duluth A7	4.80	5.25
Fairfield T2	4.80	5.25
Houston,Tex. S5	5.20	5.65
Johnstown B2	4.80	5.25
Joliet,Ill. A7	4.80	5.25
KansasCity,Mo. S5	5.40	5.85
Kokomo C16	4.90	5.35
LosAngeles B3	5.75	...
Minnequa C10	5.15	5.60
Monessen P7	4.80	5.25
Pitts.Cal. C11	5.75	6.20
Portsmth.(18) P12	4.80	5.25
Rankin A7	4.80	5.25
So.Chicago R2	4.80	5.25
So.S.Fran. C10	5.75	6.20
Sp.Pt, B2	4.90	5.35
Sterling,Ill.(1) N15	4.80	5.25
Struthers,O. Y1	4.80	5.25
Worcester A7	5.10	5.55

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.20
Alton,Ill.(1) L1	5.20
Cleveland A7	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
LosAngeles B3	6.15
NewHaven,Conn. A7	5.50
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Struthers,O. Y1	5.20
Torrance,Calif. C11	6.15
Trenton,N.J. A7	5.50
Waukegan,Ill. A7	5.20
Worcester,Mass. A7	5.50

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	123
Aliquippa,Pa. J5	123
Atlanta A11	125
Bartonville,Ill.(19) K4	123
Crawfordsville M8	126
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Houston,Tex. S5	131
Johnstown,Pa. B2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	130
Monessen,Pa. P7	123
Pittsburg,Calif. C11	143
Portsmouth,O.(18) P12	123
Rankin,Pa. A7	123
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	143
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

FENCE POSTS

	Col.
Duluth A7	112
Johnstown,Pa. B2	112
Joliet,Ill. A7	112
Minnequa,Colo. C10	120
Moline,Ill. R2	116
Williamspt,Pa., S19	n.t.$120

WOVEN FENCE, 9-15½ gage

	Col.
Ala.City,Ala.,17-18ga. R2	175
AlabamaCity,Ala. R2	109
Alquip.,Pa.9-14½ga. J5	109
Atlanta A11	111
Bartonville,Ill.(19) K4	109
Crawfordsvll,Ind. M8	112
Donora,Pa. A7	109
Duluth A7	109
Houston,Tex. S5	117
Fairfield,Ala. T2	109
Johnstown,Pa. B2	109
Johnstn,17ga.,6" B2	183
Johnstn,17ga.,4" B2	186
Joliet,Ill. A7	109
KansasCity,Mo. S5	121
Kokomo,Ind. C16	111
Minnequa,Colo. C10	116
Monessen,Pa. P7	109
Pittsburg,Calif. C11	132
Portsmouth,O.(18) P12	109
Rankin,Pa. A7	109
So.Chicago,Ill. R2	109
Sterling,Ill.(1) N15	109

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	106
Atlanta A11	107
Bartonville,Ill.(19) K4	106
Chicago W13	106
Crawfordsville M8	109
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Joliet,Ill. A7	106
Kokomo,Ind. C16	108
Minnequa,Colo. C10	113
Pittsburg,Calif. C11	130
Portsmouth,O.(18) P12	106
So.Chicago,Ill. R2	106
So.SanFran.,Calif. C10	130
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106

NAIL & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.20
Bartonville,Ill.(19) K4	5.20
Donora,Pa. A7	5.20
Duluth A7	5.20
Johnstown,Pa. B2	5.20
Joliet,Ill. A7	5.20
Kokomo,Ind. C16	5.30
Minnequa,Colo. C10	5.55
Pittsburg,Calif. C11	6.15
Portsmouth,O. P12	5.20
Rankin,Pa. A7	5.20
So.Chicago,Ill. R2	5.20
SparrowsPoint,Md. B2	5.30
Worcester,Mass. A7	5.50

NAILS & STAPLES, Stock (To Consumers)

AlabamaCity,Ala. R2	103
Aliquippa,Pa. J5	103
Atlanta A11	105
Bartonville,Ill.(19) K4	103
Cleveland A9	110
Crawfordsville M8	106
Donora,Pa. A7	103
Duluth A7	103
Fairfield,Ala. T2	103
Houston,Tex. S5	111
Johnstown,Pa. B2	103
Joliet,Ill. A7	103
KansasCity,Mo. S5	115
Kokomo,Ind. C16	105
Minnequa,Colo. C10	110
Monessen,Pa. P7	103
Pittsburg,Calif. C11	122
Portsmouth,O. P12	103
Rankin,Pa. A7	103
So.Chicago,Ill. R2	103
SparrowsPoint,Md. B2	105
Sterling,Ill.(1) N15	103
Torrance,Calif. C11	123
Worcester,Mass. A7	109

NAILS & STAPLES, Stock (To Jobbers)

	Col.
Chicago,Ill. W13	103
Minnequa,Colo. C10	107
Portsmouth,O. P12	100

NAILS, Cut (100 lb keg)

Consnohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

AXLES

Fairfield,Ala. T2	5.20
Gary,Ind. C3	5.20
Ind.Harbor,Ind. S13	5.20
Johnstown,Pa. B2	5.20
McKeesRocks,Pa. C3	5.20

TIE PLATES

Fairfield,Ala. T2	4.05
Gary,Ind. C3	4.05
Ind.Harbor,Ind. I2	4.05
Lackawanna,N.Y. B2	4.05
Minnequa, Colo. C10	4.05
Pittsburg,Calif. C11	4.20
Pittsburgh R2	4.05
Seattle B3	4.50
Steelton,Pa. B2	4.05
Torrance,Calif. C11	4.20
Weirton,W.Va. W6	4.05

JOINT BARS

Bessemer,Pa. C3	4.25
Fairfield,Ala. T2	4.25
Ind.Harbor,Ind. I2	4.25
Joliet,Ill. C3	4.25
Lackawanna,N.Y. B2	4.25
Minnequa,Colo. C10	4.25
Steelton,Pa. B2	4.25

TRACK BOLTS (20) Treated

Fairfield,Ala. T2	8.50
Lebanon,Pa. B2	8.50
Minnequa,Colo. C10	8.25
Pittsburgh,Pa. O3, P14	8.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.35
Ind.Harbor,Ind. I2, Y1	5.35
Lebanon,Pa. B2	5.35
Minnequa, Colo. C10	5.35
Pittsburgh J5	5.35
So.Chicago,Ill. R2	5.35
Struthers,O. Y1	5.35
Youngstown R2	5.35

LIGHT RAILS, Rail Steel

Huntington,W.Va. W7	3.55
Williamsport,Pa. S19	3.55

ROPE WIRE	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	7.10	7.40	7.80
Cleveland A7	7.50	7.80	8.20
Donora,Pa. A7	7.50	7.80	8.20
Fostoria,O. S1	7.50	7.80	8.20
Johnstown,Pa. B2	7.50	7.80	8.20
Monessen,Pa. P7	7.50	7.80	8.20
NewHaven,Conn. A7	7.80	8.10	8.50
Portsmouth,O. P12	7.50	7.80	8.20
SparrowsPoint,Md. B2	7.60	7.90	8.30
Struthers,O. Y1	7.50	7.80	8.20
Trenton,N.J. A7	7.80	8.10	8.50
Trenton,N.J. R5	7.50	7.80	8.20
Waukegan,Ill. A7	7.50	7.80	8.20
Williamsport,Pa. B2	7.60	7.90	8.30
Worcester,Mass. J4	7.50	7.80	8.20

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb. Under
Bessemer,Pa. C3	3.20	3.10	3.15	3.55
Ensley,Ala. T2	3.20	3.10	3.15	3.55
Fairfield,Ala. T2	...	...	...	3.55
Gary,Ind. C3	3.20	3.10	3.15	...
Ind.Harbor,Ind. I2	3.20	3.10	3.15	...
Johnstown,Pa. B2	...	...	...(16)	3.55
Lackawanna B2	3.20	3.10	...	3.55
Minnequa,Colo. C10	3.20	3.10	...	4.25
Steelton,Pa. B2	3.20	3.10	...	...

Key to Producing Companies

L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N16 New Delphos Mfg. Co.
N6 New Eng. Hgh. Carb. Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S. & W. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P5 Pilgrim Drawn Steel Crp.
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P12 Portsmouth Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R7 Rotary Electric Steel Co.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss Sheffield S. & I. Co.
S13 Standard Forgings Corp.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.

T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San. Corp.

U4 Universal Cyclops Steel

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Wstrn. Auto. Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Co.
W15 Woodward Iron Co.
W16 Wortin Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstwn. Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	19.00	18W,4Cr,3V	114.50
Extra Carbon	22.00	18W,4Cr,2V,9Co	168.50
Spec. Carbon	26.50	18W,4Cr,2V,6Co	154.00
Oil Hardening	29.00	18.25W,4.25Cr,1V,4.75Co	142.00
Eil.-Carbon-Cr	52.00	20.25W,4.25Cr,1.6V,12.25Co	266.50
Cr Hot Wrk	29.00	1.5W,4Cr,1V,8.5Mo	65.00
18W,4Cr,1V	90.50	6.4W,4.5Cr,1.9V,5Mo	69.50
18W,4Cr,2V	102.50	6W,4Cr,3V,6Mo	88.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, R2, S8, T7, U4, V2, V3.

(1) Chicago Base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. Base.
(7) Deformed.
(8) 16 gage and heavier.
(9) 6" and narrower.
(10) Pittsburgh Base.
(11) Cleveland & Pittsburgh Base.
(12) Worcester, Mass. Base.
(13) 3" & wider; over ⅛" to under 3" 5.00c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh Base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. Base.
(22) Del. San. Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	41.5	39.5	38.5	13.5	11.5	10.5
¼	6.0	0.42	39.5	37.5	36.5	15.5	13.5	12.5
⅜	6.0	0.57	36	34	33	12.5	10.5	9.5
½	8.5	0.85	43	41	42	26.5	24.5	25.5
¾	11.5	1.13	46	44	45	30.5	28.5	29.5
1	17.0	1.68	48.5	46.5	47.5	33.5	31.5	32.5
1¼	23.0	2.28	49	47	48	34	32	33
1½	27.5	2.73	49.5	47.5	48.5	34.5	32.5	33.5
2	37.0	3.68	50	48	49	35	33	34
2½	58.5	5.82	50.5	48.5	49.5	35.5	33.5	34.5
3	76.5	7.62	50.5	48.5	49.5	35.5	33.5	34.5

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va. 1½ percentage point lower on ¼", 2 points lower on ½", 3 points lower ⅝", W10; Wheatland, Pa., 2 points lower on ⅛ through ⅜", W9. Following make ½ through 3" only: Lorain, O. N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

Columns B & E: Sparrows Point, Md. B2; Wheatland, Pa., ⅛ through ⅜", W9.

Columns C & F: Alton, Ill. (Lorain, O. Base) LI; Indiana Harbor, Ind., ⅛ through 3", Y1.

Column D: Etna, Pa. N2; Monaca, Pa. P9, Sharon, Pa. M6; Butler, Pa., ⅛ through ⅜", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜" W10; Wheatland, Pa., except 2 pts lower on ⅛ through ⅜" W9. Following make ½ through 3" only: Lorain N3; Youngstown R2, Y1; Aliquippa, Pa. J5. Fontana, Calif., K1 quotes 11 points lower on ½" through 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	38.5	23	38.5	23
2½	58.5	5.82	41.5	26	41.5	26
3	76.5	7.62	41.5	26	41.5	26
3½	92.0	9.20	43.5	28	43.5	28
4	$1.09	10.89	43.5	28	43.5	28
5	1.48	14.81	43.5	28	43.5	28
6	1.92	19.18	43.5	28	43.5	28

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 4 to 24 in., inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	11.50	13.39	13.00	13.00
1¼	13	13.62	15.87	13.21	15.39
1½	13	15.05	17.71	14.60	17.18
1⅝	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2¼	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2⅝	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pacific Tube Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

BOLTS, NUTS

(To consumers)

Fob midwestern plants. Additional discounts on carriage, machine bolts, 5 for cl; 15 for full containers, except tire and plow bolts.

CARRIAGE, MACHINE BOLTS

(Per cent off list)

½-in., smaller; up to 6 in long 35
⅞ & ⅝ x 6 in., shorter. 37
¾-in. & larger x 6 in., shorter 34
All diameters longer than 6-in. 30
Tire bolts 25
Plow bolts 47
Lag bolts, 6 in., shorter 37
Lag bolts, longer than 6 in. 35

NUTS

Semifinished hexagon	A.S. Light	Reg. & Heavy
⅞-in., smaller	41 off	....
½-in., smaller	....	38 off
¼-in.-1-in.	39 off	....
⅞-in.-1-in.	....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in., larger	34 off	28 off

Additional discount of 15 for full containers.

STOVE BOLTS

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

SQUARE HEAD SET SCREWS

Upset 1-in. & smaller..51 off
¾, ⅞, & 1 x 6-in. & shorter ..... 35 off
Headless, ¼-in., larger 31 off

HEXAGON CAP SCREWS

(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright) ..... 46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter ..... 40 off

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 6.75c
⅞-in., under .....48 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....Net to $1 off

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	37.50	30.50	28.50
302	37.50	33.00	28.50
303	39.50	36.50	31.00
304	39.50	35.00	30.00
309	52.00	52.00	41.50
316	53.00	55.00	46.00
321	45.50	44.50	34.00
347	50.00	48.50	38.50
410	33.00	27.00	23.00
416	33.50	33.50	23.50
420	40.50	43.50	28.50
430	35.50	27.50	23.50
501	24.00	22.50	11.50
502	25.00	23.50	12.50

Baltimore, Types 301 through 347 sheets, except 309 E2

Baltimore, bars, wire and structurals A10

Brackenridge, Pa., sheets A4

Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4

Butler, Pa., sheets except Types 501 & 502 A10

Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c S18.

Cleveland, strip, except Type 309 quoted 51.00c, and except Type 416 A7.

Detroit, strip, except Type 309 quoted 51.00 M1

Dunkirk, N.Y., bars, wire A4

Duquesne, Pa., bars C3

Gary, Ind., sheets except Type 416 C3

Harrison, N. J., strip C18

Massillon, all products, except Type 309 bars, wire & structurals quoted 42.00c, Type 501 10.50c, Type 502 11.50c R2

McKeesport, Pa., bars; sheets except Type 416, C3

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2

Middletown, O., sheets and strip, except Types 501 and 502 and except 309 strip quoted 51.00c A10

Midland, sheets & strip C18

Munhall, Pa., bars C3

Pittsburgh, sheets C18

Reading, Pa., bars & strip except Type 309 bars quoted 42.00c C4

So. Chicago, Ind., bars & structurals C3

Syracuse, N. Y., bars, wire & structurals C18

Titusville, Pa., bars U4

Wallingford, Conn., strip W2

Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3

Washington, Pa., Types 301 through 347 sheets & strip except 303 & 309; 316 sheets 58.00c strip 60.00c W4

Watervliet, N. Y., structurals & bars A4

Waukegan, bars & wire A7

West Leechburg, Pa., strip, except Type 309 quoted 51.00c A4

Youngstown, strip C8.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb.
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4,5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	84,90	7.50
14	60,72	8.00
10,12	60	8.25
8	60	8.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

REFRACTORIES

(Prices per 1000 brick, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hardfired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

LADLE BRICK

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W.Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Dometic dead-burned, ⅜" grains; Bulk, $30.50-$31.00; single paper bags, $35.00-$35.50.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 20.00
Toluol, one deg. 19.00-23.50
Industrial xylol 20.50-26.50

Per ton bulk, ovens

Sulphate of ammonia..$45.00

Per pound, ovens

Phenol, 40 (carlots, returnable drums) 13.25
Do., less than carlots..14.00
Do., tank cars 12.50

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer ...$7.60
Old range nonbessemer..7.45
Mesabi bessemer 7.35
Mesabi nonbessemer ...7.20
High phosphorus 7.20

EASTERN LOCAL ORE

Cents, unit, del. E. Pa.

Foundry and basic 56.62% concentrates, contract .16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:
Spot: 17.00
Long-term contract..15.00
Brazil iron ore, 68-69% .19.50

TUNGSTEN ORE

Wolframite scheelite, net ton unit, duty pd. $26-$28

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. U.S. ports; prices on lower grades adjusted to Mn content and impurities.

CHROME ORE

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African
48% 2.8:1 .....37.50
48% 3:1 .....39.00
48% no ratio 31.00

South African Transvaal
44% no ratio .. $25.50-26.00
45% no ratio 26.50
48% no ratio 29.00-30.00
50% no ratio .. 29.50-30.50

Brazilian—nominal
44% 2.5:1 lump $33.65

Rhodesian
45% no ratio $27-27.50
48% no ratio 30.00
48% 3:1 lump 39.00

Domestic—rail nearest seller
48% 3:1 .....$39.00

MOLYBDENUM

Sulphide conc., lb, Mo, cont. Mines $0.90

METALLURGICAL COKE

Price per Net Ton

BEEHIVE OVENS

Connellsvll, fur. $13.00-13.50
Connellsvll, fdry. 15.50-16.00
New River, foundry ..18.00
Wise county, foundry..15.35
Wise county, furnace..14.60

OVEN FOUNDRY COKE

Kearney, N. J., ovens..$22.00
Everett, Mass., ovens .....
New England, del.‡ ..22.70
Chicago, ovens 20.00
Chicago, del. .....†21.45
Detroit, del. 23.91
Terre Haute, ovens....20.20
Milwaukee, ovens 20.75
Indianapolis, ovens 19.85
Chicago, del. 23.32
Cincinnati, del. 22.77
Detroit, del. 23.75
Ironton, O., ovens....19.40
Cincinnati, del. 21.63
Painesville, O., ovens..20.90
Buffalo, del. 23.02
Cleveland, del. 22.62
Erie, del. 21.04
Birmingham, ovens 17.70
Philadelphia, ovens 20.45
Swedeland, Pa., ovens..20.40
Portsmouth, O., ovens..19.50
Detroit, ovens 20.65
Detroit, del. *21.70
Buffalo, del. 22.95
Flint, del. 23.00
Pontiac, del. 21.98
Saginaw, del. 23.30

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.03 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS				PLATES	
	H.R. 18 Ga., Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§	Standard Structural Shapes	Carbon	Floor
New York (city)	5.60	6.51	7.10	5.82	...	5.77	6.31	8.28	5.53	5.85	7.36
New York (c'try)	5.40	6.31	6.90	5.62	...	5.57	6.11	8.08	5.33	5.65	7.16
Boston (city)	5.75	6.75**	7.16	5.80	...	5.72	6.22	8.77	5.62	5.95	7.45
Boston (c'try)	5.55	6.55**	6.96	5.60	...	5.52	6.02	8.57	5.42	5.75	7.25
Phila. (city)	5.90	6.49	6.88	5.65	...	5.65	6.21	8.10	5.35	5.60	6.80
Phila. (c'try)	5.65	6.24	6.63	5.40	...	5.40	5.96	7.85	5.10	5.35	6.55
Balt. (city)	5.46	6.36	6.81	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)	5.31	6.21	6.66	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va.	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse)	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)	4.85	5.75[4]*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse)	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse)	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse)	5.27‡	5.94**	6.83	5.39	6.10	5.44	5.95	...	5.44	5.64	7.05
Chicago (city)	5.05	5.95[4]	7.05	5.05	6.35-6.85	5.10	5.60	7.90[8]	5.10	5.30	6.75
Chicago (w'hse)	4.85	5.75[4]	6.85	4.85	6.15-6.65	4.90	5.40	7.70[8]	4.90	5.10	6.55
Milwaukee (city)	5.18	6.08[4]	7.18	5.18	6.48-6.98	5.23	5.78	8.03[8]	5.23	5.43	6.88
Milwau. (c'try)	5.03	5.93[4]	7.03	5.03	6.33-6.83	5.08	5.63	7.88[8]	5.08	5.28	6.73
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse)	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham (c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr.	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	5.60	7.15	7.60	6.10	7.75	5.75	7.40	...	5.60	5.65	7.90
L. A. (w'hse)	5.45	7.00	7.45	5.95	7.60	5.60	7.25	...	5.45	5.50	7.75
San Francisco	6.15[10]	7.50[3]	8.10	6.75[10]	8.25[8]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma	6.70[7]‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); § as rolled; ** 17 gage; †† as annealed. Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499 lb.

LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

(Please turn to page 142)

Lead and Tin Prices Decline

Straits tin drops 7 cents a pound to 96.00c while lead drops 3/8-cent to basis of 14.55c, St. Louis. Markets ease as aftermath of devaluation of pound in Britain

New York—Initial impact of the devaluation of the pound Sterling has hit the metal markets in this country. As a result, lead prices have dropped ⅜-cent a pound while Straits tin dropped 7 cents a pound. Copper, zinc and aluminum prices are unchanged.

Lead—Effective on Sept. 26, offerings of lead were available at 14.75c a pound, New York, by a leading custom smelter. St. Joseph Lead Co. met the lower offerings, quoting 14.55c a pound, St. Louis and 14.75c, New York.

The drop in lead is the first downward adjustment since it started its recovery from 12.00c a pound to 15.12½c a pound, New York. Shortly after the devaluation of sterling currencies, foreign lead was freely offered here at 14.00c to 14.25c, on dock New York, including the import duty. This is equivalent to about 14.25c to 14.75c a pound to the United States consumer, depending upon the distance to his plant. Part of the metal originated in Japan, Germany and Yugoslavia. More foreign lead has been made available here because the supplies which normally would go to Europe are greater than can be used there. It includes larger-than-normal supplies from Mexico and Canada.

Scrap offerings of lead also are increasing. One smelter of scrap battery plates has lifted the smelting fee for such plates to $80 a ton. Several weeks ago the charge was as low as $45 a ton and had risen to around $55 to $60 by the beginning of last week.

In the meantime there is further evidence of a sharp pick-up in manufacture and consumption of replacement batteries which consume about one-third of the lead supply.

Market authorities here say that even though domestic demand subsided from the hectic buying during June, July and August, it had been enough to take care of the usual day-to-day supply from domestic and regular suppliers of foreign lead to this country. Demand is not large enough now to take care of the increased offerings from abroad at price concessions.

Tin — Reconstruction Finance Corp. has reduced to 96.00c a pound the price at which it will sell tin to industrial users. This represents a decline of 7 cents a pound from the previous price of $1.03. The action follows Great Britain's cut in the price of Straits tin to 95.00c a pound from $1.03, c.i.f. New York.

RFC also plans to lower the price it pays for Bolivian tin on a scale equal to its cut in the selling price of refined tin to domestic consumers. No exact price per pound can be listed at this time on Bolivian purchases since tin imports from that country vary greatly in the quality of ore.

British Ministry of Supply established a price of 93.75c a pound in England, an increase of 22.62½ cents and establishing an all-time high. The Ministry also announces that it will stop its bulk buying of tin and arrange for reopening of the London Metal Exchange to allow free trading in tin.

Reaction in the Malay States to the new tin price set in London is described as generally favorable in dispatches from Kuala Lumpur. However, some representatives of European-owned mines fear that since production of the metal already exceeds consumption, the high sterling price might encourage searches for substitutes.

Malayan producers are said to be withholding metal from the Ministry's Singapore agent until the new price to producers is set. Pending outcome of negotiations, the Ministry will continue to buy tin at prices prevailing prior to devaluation.

The Ministry's total stocks of tin in the United Kingdom and overseas are believed to be around 20,000 tons. Method of disposing of this stock (equal to almost a year's United Kingdom consumption) is one of the crucial matters to be decided on in talks of reopening arrangements now proceeding with the committee of the London Metal Exchange. It is deemed unlikely in London that the Ministry will unload stocks when the market reopens as this would depress prices. Some part of the stocks may be retained as a strategic stockpile.

Metal circles in London believe that if the market reopens around Nov. 1, a decision might be taken mutually to discontinue the tin allocation program which has operated in the postwar period of shortages and which is scheduled to continue until the year-end.

Dutch tin circles view with interest the British decision to permit reopening of the London Metal Exchange for dealings in tin. Such a move was not unexpected following devaluation of the pound but a certain amount of doubt exists as to how it will affect the tin market in general, according to cables from that country. Asked if the Dutch would resume their prewar practice of using the London Metal Exchange for hedging purposes, a spokesman for a leading Dutch firm said it was too early to state what methods would be adopted under the new conditions.

Copper—A steady price tone prevails in the domestic market, all interests awaiting outcome of wage negotiations in several of the basic industries which will have an important bearing on the general industrial activity for months to come. Electrolytic held at 14.62½c, Connecticut.

Shipments of brass and bronze ingots increased to 14,194 tons in August from 10,220 tons in July.

Zinc—Supply of special high grade zinc has been temporarily curtailed by a strike at New Jersey Zinc Co.'s large plant at Palmerton, Pa. Moderate sales of prime western zinc are being made at the ten-cent East St. Louis level. Buyers of large tonnages are awaiting the outcome of the steel labor controversy.

Subsidy Bill on Senate Agenda

Washington—The O'Mahoney mine subsidy bill will be called up for Senate passage before Congress adjourns. This assurance is given by Senator O'Mahoney (Dem., Wyo.) who has talked with President Truman about the legislation and is "satisfied" that the President approves the measure. Some question had arisen as to whether the President would support the O'Mahoney bill, even though high administration officials have endorsed it.

The O'Mahoney measure would set up a Minerals Conservation Board to promote exploration and conservation of minerals and metals. The Board would promote exploration by sharing in the cost of exploration projects. It would be empowered to promote conservation by participating in the cost of maintaining a mining property in stand-by condition or by purchasing all or any part of the metals or minerals resulting from production from such deposit.

Under the legislation, no new conservation or exploration project could be made after three years. In the meantime, no contract could be made to run for more than two years.

Produces Zirconium Compounds

Lorain, O.—Brush Beryllium Co. has started experimental production of zirconium compounds at its local plant. A. N. MacIntyre, superintendent at the plant when it produced beryllium prior to a fire about a year ago, will be in charge of the zirconium project. The one remaining chemical unit in the plant will be used for the experimental work under contract with the U. S. Atomic Energy Commission. The experimental program will take four to six months to complete.

Tin Plate Needs Drop

Los Angeles—Tin plate requirements for canneries in this district have been severely affected by a spreading slowdown in operations of Southern California tuna packers. Two more large tuna canneries have announced they will send no more vessels to sea for an indefinite period, ascribing this to heavy inventories and anticipated decline in tuna sales in eastern markets during the fall and winter months.

Aluminum Plant Boosts Output

Spokane, Wash.—About 75 workers of the 500 laid off several months ago, have been recalled to their jobs at Permanente Metals Corp.'s Trentwood aluminum plant. The increased employment is attributed to improved business.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 17.62½c, Conn. Valley, Lake, 17.75c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 15.50-16.50c; 88-10-2 (No. 215) 24.50c; 80-10-10 (No. 305) 21.00c; No. 1 yellow (No. 405) 13.25-14.25c.

Zinc: Prime western 10.00c, brass special 10.25c, intermediate 10.50c, East St. Louis; high grade 11.00c, delivered.

Lead: Common 14.55c; chemical 14.65c; corroding 14.65c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.00-16.50c; No. 12 foundry alloy (No. 2 grade) 15.25-15.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 17.25c; grade 2, 16.25c; grade 3, 15.25c; grade 4, 14.25c. Prices include freight at carload rate up to 75 cents per 100 lb.
5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) 96.00c; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, nom.; grade C, 99.65-99.79%, incl., nom.; 99.5-99.649% nom.; grade F, 98-98.999% nom. for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $73-$75 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 73.25c per ounce.

Platinum: $69-$72 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

Sheet: Copper 31.30; yellow brass 28.19;commercial bronze, 95%, 31.28; 90%, 30.84; red brass, 85%, 29.89; 80%, 29.47; best quality, 29.01; nickel silver, 18%, 41.78; phosphor-bronze, grade A, 5%, 50.47.

Rods: Copper, hot rolled 27.15; cold drawn 28.40; yellow brass free cutting, 22.76; commercial bronze, 95% 30.97; 90% 30.53; red brass 85% 29.58; 80% 29.16.

Seamless Tubing: Copper 31.34, yellow brass 31.20; commercial bronze 90% 33.50; red brass 85% 32.80; 80% 32.38.

Wire: Yellow brass 28.48; commercial bronze, 95% 31.57; 90% 31.13; red brass, 85% 30.18; 80% 29.76; best quality brass 29.30.
Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots 22.42½, l.c.l. 23.05, c.l. 22.55; weatherproof, f.o.b. eastern mills, 100,000 lb lots 24.693, l.c.l. 25.443, c.l. 24.943; magnet, delivered, c.l. 27.62½, 15,000 lb or more 27.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $19.75 per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $19.75 per cwt. Traps and bends: List price plus 53%.

ZINC

Sheets, 15.50c f.o.b. mill, 36,000 lb and over Ribbon zinc in coils, 15.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 14.00c; over 12-in., 15.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c.

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.25c; over 250 lb, 24.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 2090 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 40.50c, f.o.b. Cleveland; 39.25c, Detroit; 39.25c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 88.00c; 100 lb kegs, 89.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze			
95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red brass			
85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.25; No. 2 copper 13.25; light copper 12.25; composition red brass 11.00-11.25; radiators 9.00-9.25; heavy yellow brass 8.75-9.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.00-14.25; No. 2 copper 13.00-13.25; light copper 12.00-12.25; refinery brass (60% copper) per dry copper content 12.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.25-12.50; No. 2 11.25-11.50; light copper 10.25 - 10.50, No. 1 composition red brass 9.25-9.50, No. 1 composition turnings 8.75-9.00, mixed brass turnings 5.75-6.00; new brass clippings 10.00-10.50, No. 1 brass rod turnings 7.75-8.00; light brass 5.75-6.00; heavy yellow brass 6.25-6.50; new brass rod ends 7.75-8.00; auto radiators, unsweated 7.75-8.00; cocks and faucets, 7.50-7.75; brass pipe 8.25-8.50.
Lead: Heavy 10.50-11.00, battery plates 5.50-6.00, linotype and stereotype 11.75-12.00, electrotype 11.00-11.25, mixed babbitt 11.75-12.00, solder joints, 14.50-15.00.
Zinc: Old zinc 4.00-4.50, new die cast scrap 3.50-4.00, old die cast scrap 2.50.
Tin: No. 1 pewter nominal, block tin pipe nominal, No. 1 babbitt nominal.
Aluminum: Clippings 2S 10.00-10.50, old sheets 7.00-7.50, crankcase 7.00-7.50, borings and turnings 3.00-3.50.

DAILY PRICE RECORD

1949	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Sept. 26-29	17.625	14.55	10.00	96.00	17.00	38.50	40.00	73.25
Sept. 8-24	17.62½	14.92½	10.00	103.00	17.00	38.50	40.00	73.25
Sept. 7	17.62½	14.92½	10.00–10.50	103.00	17.00	38.50	40.00	73.25
Sept. 1-6	17.62½	14.92½	10.00–10.50	103.00	17.00	38.50	40.00	73.00
Aug. Avg.	17.625	14.806	10.000	103.00	17.000	38.500	40.000	71.889
July Avg.	17.279	13.335	9.346	103.000	17.000	38.500	40.000	71.500
June Avg.	16.606	11.850	9.548	103.000	17.000	38.500	40.000	71.500

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

STEELMAKING SCRAP COMPOSITE

Sept. 29	$27.58
Sept. 22	27.08
Aug. 1949	20.86
Sept. 1948	43.33
Sept. 1944	18.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$29.50-30.00
No. 2 Heavy Melt.	27.50-28.00
No. 1 Busheling	29.50-30.00
No. 1 Bundles	29.50-30.00
No. 2 Bundles	22.50-23.00*
No. 3 Bundles	21.50-22.00*
Heavy Turnings	22.00-23.00*
Machine Shop Turnings	20.00†
Mixed Borings, Turnings	20.00†
Short Shovel Turnings	22.00*
Cast Iron Borings	21.00*
Low Phos. Steel	31.00-32.00*

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00
No. 1 Machinery Cast	39.00-40.00
Charging Box Cast	31.00-32.00*
Heavy Breakable Cast	28.00-29.00*

Railroad Scrap**

No. 1 R.R. Heavy Melt.	32.00-32.50
Axles	36.00-37.00
Rails, Random Length	35.00-36.00
Rails, 2 ft and under	39.00-40.00
Rails, 18 in. and under	40.00-41.00
Railroad Specialties	33.00-34.00
Angles, Splice Bars	33.00-34.00

* Nominal.
** Brokers' purchase prices.
† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	$26.50†
No. 2 Heavy Melt. Steel	25.50†
No. 1 Busheling	26.50†
No. 1 Bundles	26.50†
No. 2 Bundles	23.50†
Machine Shop Turnings	17.00†
Mixed Borings, Turnings	19.00†
Short Shovel Turnings	19.00†
Cast Iron Borings	19.00†
Bar Crops and Plate	27.50†
Punchings & Plate Scrap	27.50†
Cut Structurals	29.50†

† Nominal.

Cast Iron Grades†

No. 1 Cupola	40.00-41.00
Charging Box Cast	34.00-35.00
Stove Plate	35.00-36.00
Heavy Breakable Cast	32.00-33.00
Unstripped Motor Blocks	30.50-31.50
Malleable	34.00-35.00
Brake Shoes	31.00-32.00
Clean Auto Cast	42.00-43.00
No. 1 Wheels	35.00-36.00
Burnt Cast	32.00-33.00

† Nominal.

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00
R.R. Malleable	34.00-35.00
Rail, 3 ft and under	38.00-39.00
Rails, Random Lengths	32.00-33.00
Cast Steel	27.00-28.00
Railroad Specialties	31.00-32.00
Uncut Tires	30.50-31.00
Angles, Splice Bars	34.00-35.00

VALLEY

No. 1 Heavy Melt. Steel	$31.00-31.50
No. 2 Heavy Melt. Steel	30.00-30.50
No. 1 Bundles	31.00-31.50
No. 2 Bundles	27.00-27.50
Machine Shop Turnings	19.00-20.00
Short Shovel Turnings	22.00-23.00
Cast Iron Borings	22.00-23.00
Low Phos.	32.00-33.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	32.00-33.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	23.50
No. 1 Busheling	23.50
No. 1 Bundles	25.00
No. 2 Bundles	22.50
Machine Shop Turnings	17.00
Short Shovel Turnings	18.00
Mixed Borings, Turnings	16.00
Bar Crop and Plate	27.00
Punchings & Plate Scrap	27.00
Cut Structurals	26.00
Elec. Furnace Bundles	25.00-25.50
Heavy Turnings	25.00
No. 1 Chemical Borings	26.00

Cast Iron Grades

No. 1 Cupola Cast	38.00
No. 1 Machinery Cast	39.00
Charging Box Cast	35.00-36.00
Heavy Breakable Cast	35.00-36.00
Unstripped Motor Blocks	33.00
Clean Auto Cast	39.00
No. 1 Wheels	38.00-39.00
Malleable	36.00-37.00*

* Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	22.00
No. 1 Busheling	25.00
No. 1 Bundles	25.00
No. 2 Bundles	20.00
Machine Shop Turnings	11.00
Short Shovel Turnings	15.00
Mixed Borings, Turnings	15.00
Cast Iron Borings	15.00

Cast Iron Grades

No. 1 Cupola Cast	38.50
Charging Box Cast	31.00
Heavy Breakable Cast	34.00
Stove Plate	30.00
Unstripped Motor Blocks	20.00
Brake Shoes	22.00
Clean Auto Cast	38.50
Drop Broken Cast	43.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	27.00
R.R. Malleable	33.00
Rails, Rerolling	37.00
Rails, Random Lengths	35.00
Rails, 18 in. and under	43.50

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	$20.00-21.00
No. 1 Bundles	23.00-24.00
No. 2 Bundles	20.00-21.00
No. 1 Busheling	23.00-24.00
Machine Shop Turnings	15.00-16.00
Mixed Borings, Turnings	15.00-16.00
Short Shovel Turnings	17.00-18.00
Cast Iron Borings	17.00-18.00
Punchings & Plate Scrap	23.00-24.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-33.00
Heavy Breakable Cast	28.00-29.00
Clean Auto Cast	32.00-33.00

BUFFALO

No. 1 Heavy Melt. Steel	$28.00-28.50
No. 2 Heavy Melt. Steel	25.50-26.00
No. 1 Bushelings	25.50-26.00
No. 1 Bundles	27.50-28.00
No. 2 Bundles	24.00-24.50
Machine Shop Turnings	19.00-19.50
Mixed Borings, Turnings	20.00-20.50
Cast Iron Borings	20.00-20.50
Short Shovelings	21.50-22.00
Low Phos.	29.50-30.00

Cast Iron Grades

No. 1 Cupola	36.00-37.00
No. 1 Machinery	37.00-37.50
Mixed Yard	35.00-35.50
Malleable	35.50-36.00

Railroad Scrap

Rails, 3 ft. and under	36.00-37.00
Scrap rails	31.00-32.00
Specialties	32.00-33.00
No. 1 car wheels	33.00-34.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$18.50
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	15.00-16.00
No. 1 Bundles	18.00-18.50
No. 2 Bundles	14.00-15.00
No. 3 Bundles	nominal
Machine Shop Turnings	10.00-11.00
Mixed Borings, Turnings	10.00-11.00
Short Shovel Turnings	11.00-12.00
Punchings & Plate Scrap	22.00-23.00
Cut Structurals	22.00-23.00
Elec. Furnace Bundles	21.00

Cast Iron Grades

No. 1 Cupola Cast	31.00-32.00
No. 1 Machinery	33.00
Charging Box Cast	26.00-27.00
Heavy Breakable	26.00-27.00
Unstripped Motor Blocks	27.00
Malleable	27.00-28.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$17.00-17.50
No. 2 Heavy Melt. Steel	15.00-15.50
No. 1 Bundles	17.00-17.50
No. 1 Busheling	14.00-14.50
Machine Shop Turnings	6.50-7.00
Mixed Borings, Turnings	6.50-7.50
Short Shovel Turnings	7.50-8.50
Bar Crops and Plate	17.50-18.00
Punchings & Plate Scrap	17.50-18.00
Chemical Borings	12.00-12.50

Cast Iron Grade

No. 1 Cupola Cast	30.00-31.00
Mixed Cast	27.00-28.00
Heavy Breakable Cast	18.00-20.00
Stove Plate	22.00-23.00
Unstripped Motor Blocks	20.00-21.00

CHICAGO

No. 1 Heavy Melt. Steel	$28.00
No. 2 Heavy Melt. Steel	25.00-26.00
No. 1 Bundles	28.00
No. 2 Bundles	22.50-23.00
No. 3 Bundles	17.00-18.00
Machine Shop Turnings	18.00-19.00
Mixed Borings, Turnings	18.00-19.00
Short Shovel Turnings	19.00-20.00
Cast Iron Borings	16.00-17.00
Bar Crops and Plate	29.00-31.00
Punchings	29.00-31.00
Elec. Furnace Bundles	25.00-26.00
Heavy Turnings	23.00-24.00
Cut Structurals	27.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	41.00-42.00
Clean Auto Cast	41.00-42.00
No. 1 Wheels	33.00-34.00
Stove Plate	29.00-30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	31.00-32.00
Malleable	34.50-35.50
Rails, Rerolling	41.00-42.00
Rails, Random Lengths	34.50-35.50
Rails, 2 ft. and under	38.00-39.00
Rails, 18 in. and under	39.00-40.00
Railroad Specialties	33.00-34.00
Angles, Splice Bars	35.50-36.50

ST. LOUIS

No. 1 Heavy Melt. Steel	$27.00-28.00
No. 2 Heavy Melt. Steel	24.00-25.00
Machine Shop Turnings	18.00-19.00
Short Shovel Turnings	18.00-19.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-38.00
Charging Box Cast	34.00-35.00
Heavy Breakable Cast	32.00-33.00
Brake Shoes	30.00-31.00
Clean Auto Cast	40.00-42.00
Burnt Cast	30.00-31.00

Railroad Scrap

R.R. Malleable	31.00-32.00
Rails, Rerolling	36.00-38.00
Rails, Random Lengths	32.00-33.00
Rails, 3 ft. and under	36.00-38.00
Uncut Tires	26.00-27.00
Angles, Splice Bars	32.00-33.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	24.50
No. 1 Busheling	24.00
No. 2 Bundles	22.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings	19.00
Cast Iron Borings	18.00
Bar Crops and Plate	30.00
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	34.50
Stove Plate	28.00-30.00
No. 1 Wheels	23.00-24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.00
R. R. Malleable	nominal
Rails, Rerolling	30.00
Rails 3 ft. and under	25.00-26.00
Angles and Splice Bars	31.00-33.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	15.00
Nos. 1 & 2 Bundles	13.00

Cast Iron Grades

No. 1 Cupola Cast	23.00-25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Wheels	17.00
Rails, Random Lengths	17.00

SEATTLE

No. 1 Heavy Melt. Steel	$16.00
No. 2 Heavy Melt. Steel	16.00
No. 1 Bushelings	13.50
Nos. 1 & 2 Bundles	14.00
No. 3 Bundles	nom.
Machine Shop Turnings	11.00
Mixed Borings, Turnings	11.00
Punchings & Plate Scrap	22.00
Cut Structural	22.00
Elec. Furnace Bundles	23.00

Cast Iron Grades

No. 1 Cupola Cast	20.00-22.00
Heavy Breakable Cast	17.00
Stove Plate	17.00
Unstripped Motor Blocks	17.00
Malleable	20.00
Brake Shoes	17.00-18.00
Clean Auto Cast	23.00
No. 1 Wheels	22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Railroad Malleable	22.00
Rails, Random Lengths	17.00
Angles and Splice Bars	17.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Electric Furnace Bundles	26.00

Cast Iron Grades

No. 1 Cupola Cast	$30.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

(Delivered prices)

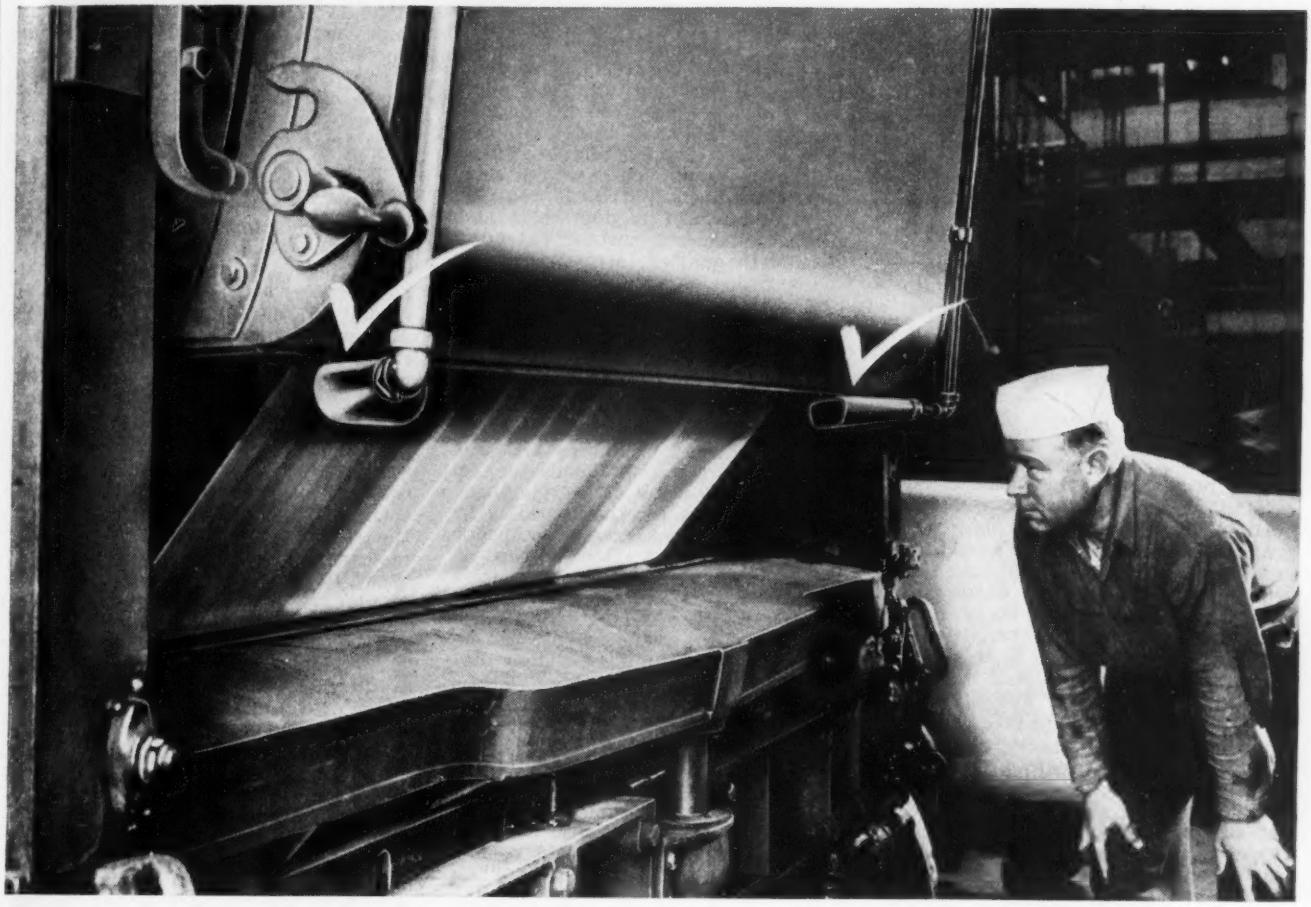
Heavy Melt.	$20.00
No. 1 Bundles	20.00
Mechanical Bundles	18.00
Mixed Steel Scrap	16.00
Mixed Borings, Turnings	14.00
Rails, Remelting	20.00
Rails, Rerolling	23.00
Busheling	14.00
Bushelings new factory, prep'd	18.00
Bushelings new factory, unprep'd	13.00
Short Steel Turnings	14.00

Cast Iron Grades*

Cast	33.00-35.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

"We've put out more than one fire here . . .



. . . *and the presses started rolling again RIGHT AWAY!"*

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No fire damage—no downtime for after-fire clean-up—because the carbon dioxide (CO_2) from a *Kidde* System leaves no mess behind. The presses were ready to roll the instant the blaze was killed!

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Sheets, Strip . . .

Probably about 30 days' stocks of sheets and strip are on had in consumers' plants

Sheet and Strip Prices, Pages 117 & 118

Chicago — At midweek with the strike deadline rapidly approaching, steel men were being besieged with instructions from consumers to ship as much of orders as were ready, even though it might mean less than carload lots. This "hang the cost, give us the steel" attitude reflected a fear that a steel strike might be a prolonged affair in which the ultimate consumer would suffer. Consensus among steelmen is that on the average and considering all products about 30 days' stocks are on hand in consumers' plants.

The unbalance is most pronounced in galvanized and cold-rolled sheets, with deliveries of both lagging far behind promises in most cases. An outstanding exception to this is with participants in the grain bin program. One local producer says that, except for less than 100 tons, all commitments have now been met. Other galvanized sheet users have had intake reduced, however, to satisfy the urgency of this need and in consequence some are trying to place orders now for delivery in first quarter of next year. Cold-rolled is only slightly less tight, although general belief is that the steam behind the push for steel for automaking has disappeared and guesses are that output schedules will be reduced about 10 per cent in October and will contract even further in November and December, releasing a sizable amount of sheet tonnage to other uses, household appliances being a major one. Demand for tin plate has eased, the seasonal peak having passed.

Pittsburgh—Well sustained demand from automotive industry and for government storage bins is principal factor for continued tight supply of galvanized and cold-rolled sheets. Sellers operated under heavy pressure to meet request for deliveries prior to Oct. 1 strike deadline. This is particularly true of the relatively few steel items available from stock. Continued slight improvement in metalworking operations among electrical appliance concerns is an encouraging factor, resulting in increased demand for silicon and enameling stock. Barring a steel strike, continuation of near-capacity production schedules for cold-rolled sheets throughout final months this year will depend largely on whether the automotive industry can maintain its present record-breaking assembly pace. Sheet and strip inventories among metalworking companies are not believed excessive, with the possible exception of those held by the auto builders.

New York—Cold sheet consumers are willing to order into next year and some producers, while taking no formal action, are accepting orders for shipment in January to regular customers. Hot-rolled sheets are offered for shipment within four to six weeks provided there are no important labor disruptions.

Demand for stainless and electrical sheets shows further improvement, although delivery schedules aren't extended to any marked degree.

Boston—Larger consumers of flat-rolled steel generally have inventory of 60 days by filling gaps from warehouse. There are exceptions, but shipments over last six weeks have gone far toward building and balancing steel reserves. Fabricators of 275-gallon household fuel tanks are pressing for heavy gage carbon sheets and any halt in shipments would soon mean curtailments in that group of users. Volume of buying holds and mill schedules are further extended into fourth quarter; some appear to be oversold on cold-rolled carbon sheets while galvanized is most extended of flat-rolled products. Pressure for delivery is strong.

Philadelphia—Shipments of cold-rolled and galvanized sheets are well extended, with a further tightening also noticeable in enameling stock. In general, most producers are well covered for the fourth quarter on all three grades and have been turning down orders for that period. In some instances sellers are accepting orders for shipment after the turn of the year, but are restricting such commitments to their regular trade. Hot-rolled sheet deliveries, on the other hand, are available within four to six weeks, assuming no labor disruption.

Cincinnati—Demand for sheets continues strong, ascribed to production requirements even though some consumers are increasing inventories. Schedules for fourth quarter are filling up, district mills expecting to be sold up soon on carbon grades. Cold-rolled and galvanized sheets appear no easier. Some pickup has developed in stainless sheet demand.

St. Louis—Sheet demand is holding an even keel since the sharp pickup dating from Aug. 15. Best delivery mills can promise is December; February, for galvanized sheets. Orders are particularly strong from stove makers, electrical goods manufacturers and household appliance makers. Mills say it is more than mere rebuilding of low inventories. Some consumers who bought no sheets in June and July today are being forced to purchase warehouse sizes and take considerable scrap loss. Consumers who stopped buying due to inventory jitters are now trying to place orders due to a shortage scare. Production remains at practicable capacity here, with Granite City Steel Co. occasionally cutting back output whenever quality threatens to suffer from the top production pace.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 117

Seattle—Rolling mills are engaged at capacity. They are expediting deliveries in view of the uncertain labor prospect. Inquiry for reinforcing materials continues strong and steady, but demand for merchant bars is sluggish.

Northwest Steel Rolling Mills Inc., this city, has taken 400 tons for an addition to the Seattle Medical-Dental building. Fair sized tonnages are pending, chiefly for state roads in Oregon, Washington and Montana.

Steel Bars . . .

Bar Prices, Page 117

Pittsburgh—Cold-finished bar demand is well diversified, with some improvement noted, particularly from electrical appliance concerns. Bulk of ordering is for prompt delivery. Those companies not able to make requested early delivery on special sizes are losing the business in some instances. Sellers are offering standard sizes from stock; partially finished stock can be drawn to desired specifications for shipment within a few days. Deliveries on special shapes are extended 4 to 5 weeks. Cold finishers have experienced little difficulty in obtaining hot-mill specifications to meet requirements. Occasionally hot-mill schedules are held up pending accumulation of sufficient tonnage of a specific size for rolling.

Philadelphia—While bar producers have a good line on the mill prices of their competitors, they are having increasing difficulty in knowing what their real competition is in view of the steadily increasing trend in the movement of steel by trucks, instead of by rail. In the case of rail shipments, rates are definitely established and, without too much trouble, can be appraised in their relation to movements between given points. With trucks, it is quite different, because of the keen competition among truckers and because of the large number of truckers.

Bar demand continues to reflect the lack of railroad requirements, particularly with various railroad shops which are down or practically down, including notably the Altoona, Pa., shops of the Pennsylvania, which are down due in part to the falling off in coal shipments. Forge shops generally are specifying lightly, with district producers of small forgings operating on an average about three days a week; producers of large forgings are very much on a "touch and go" basis. Manufacturers of conveying equipment are operating at a decidedly lower rate than a year ago, with suspensions in the coal mining districts having a bearing.

Boston—Although consumption of carbon steel bars is slightly heavier, this is not showing up in ratio of buying, indicating many users are still drawing on inventory. This is notably true of cold-finished stock and buying generally is of fill-in character with prompt delivery wanted. There are scattered openings in hot-rolled schedules for this month while cold-finished is available in two to three weeks. Production at cold finishing mills is still on a reduced scale. Slight improvement in alloys also brings pressure for prompt shipment.

Chicago—In popular sizes, hot and cold-finished bar demand is remaining constant and in spots improving, but in the less widely used sizes, including those at both large and small ends of the producing range, demand is spotty and rolling capacity is available in a relatively short time. Cold-drawers generally are fairly well stocked with hot material in the more popular ranges and have pared their stocks of slower-moving items to more realistic levels. Sellers note an

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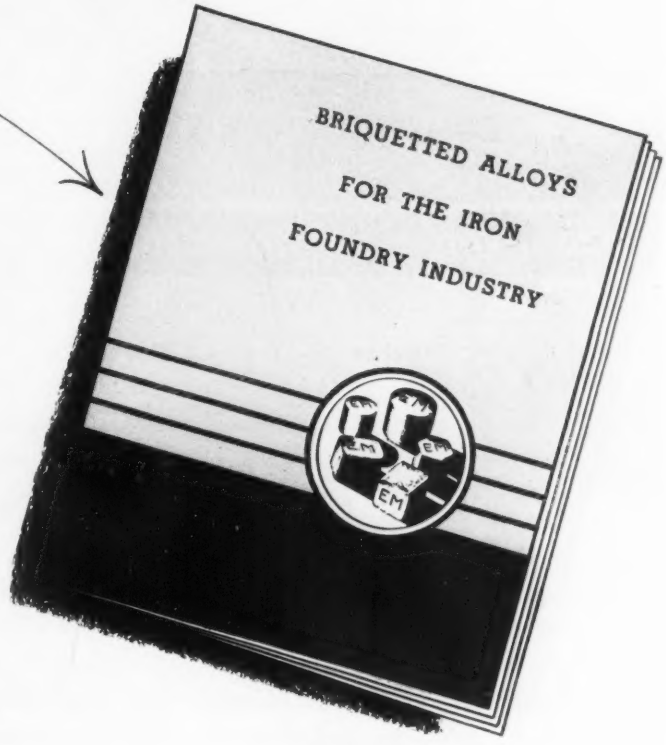

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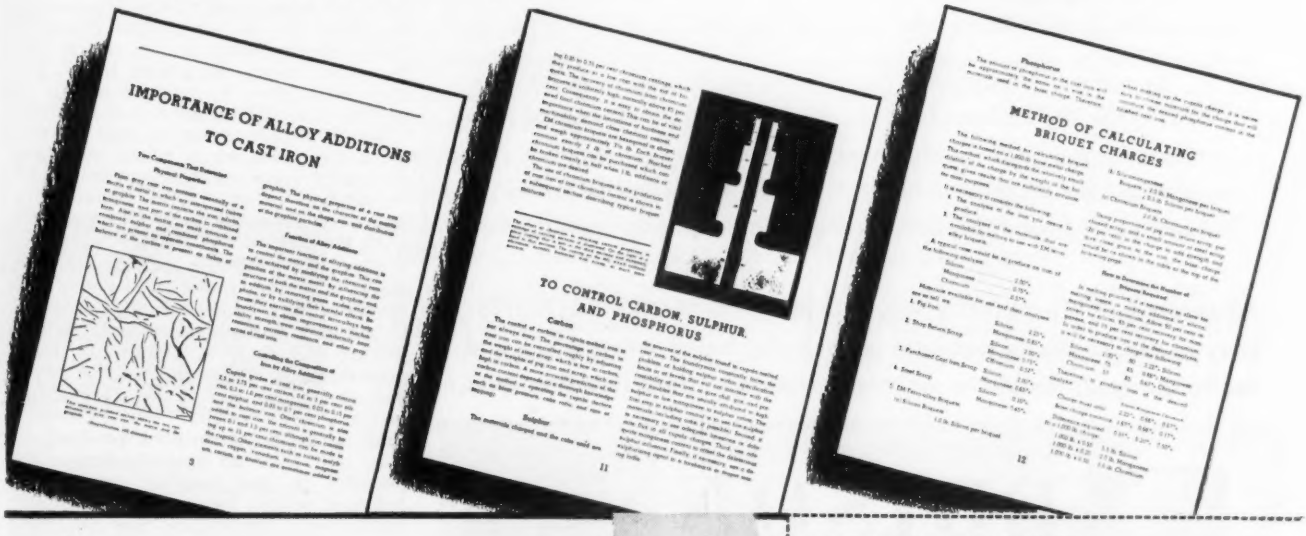
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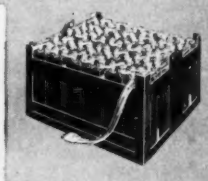
STORAGE BATTERIES



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encouraging upturn in inquiries, which they think stems more from business upturn than from the unsettled condition of labor. Most local mills are booked for a month ahead and a few continue allocating their output. One mill reports that labor trouble at several plants of its largest consumer is forcing the stockpiling of steel products. There is presently no indication that curtailment in steelmaking operations will be necessary as a result.

Plates . . .

Plate Prices, Page 117

Philadelphia—Plate mills were under pressure throughout most of last week to get out tonnage before the Oct. 1 strike deadline, but reported little forward buying. Most producers were still in position to ship tonnage against new orders within three to four weeks, and even less in some instances, provided there was no strike. Meanwhile, no mill was operating at anywhere near capacity.

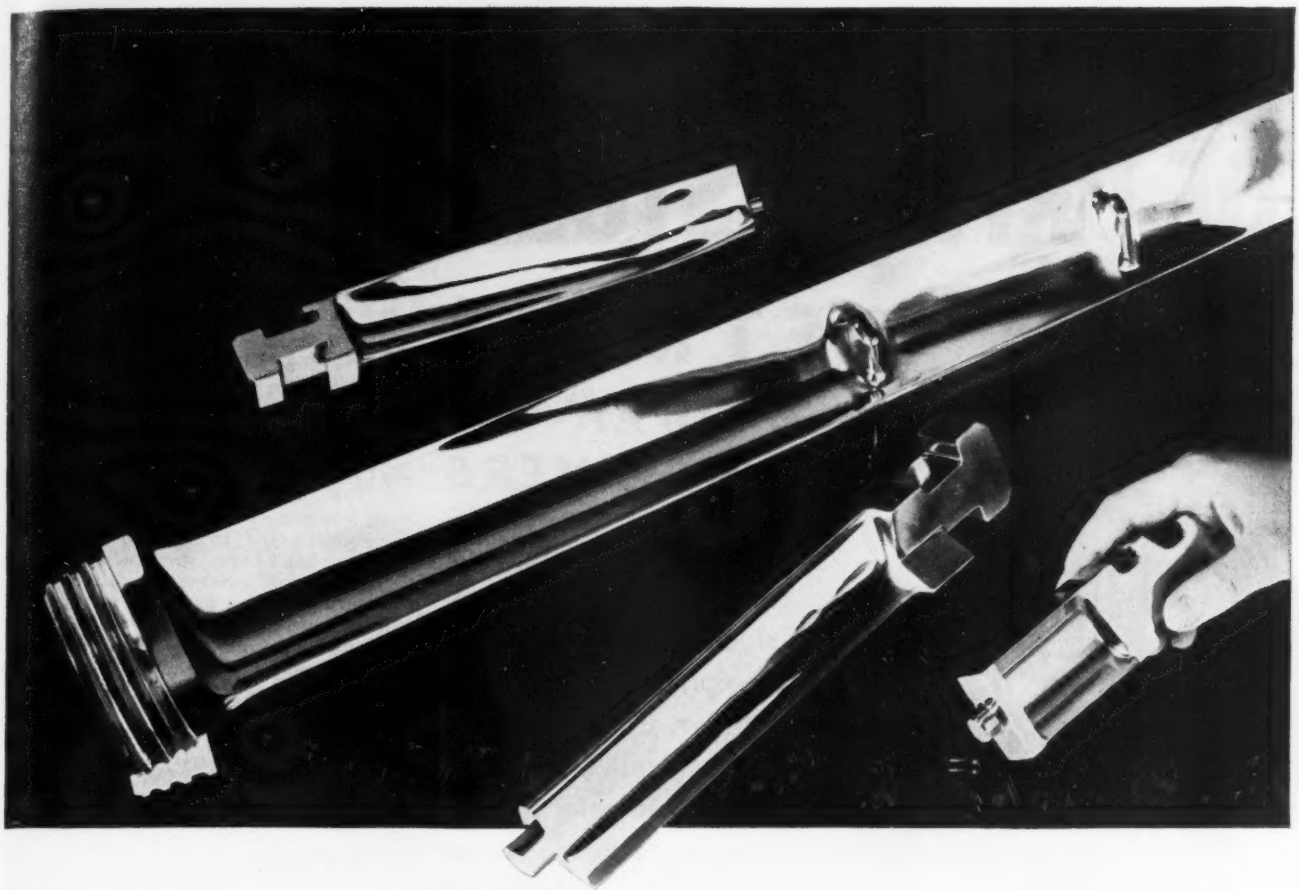
Principal demand is for light 3/16 and ¼-inch plates for domestic fuel oil tanks and heaters, with specifications leveling as the fall season gets under way. Requirements of heavy lines remain generally quiet, although local ship needs may eventually be stepped up as a result of the low bid offered by the Sun Shipbuilding & Dry Dock Co., Chester, Pa., on two 18,000-gross ton combination passenger and truck-trailer vessels for West Coast service. Each ship will require 8500 tons, chiefly plates. The Maritime Commission opened the bids last week and probably will take no action for at least 30 days. Six, out of 13 yards invited to figure, submitted bids.

This is the second sizable ship contract to come up recently, the other being a diesel-electric passenger liner for operation by the Mississippi Shipping Co. on which the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., was low. The ship will have a gross tonnage of 14,000, not 23,000, as noted recently.

Some improvement in ship repairs is in prospect, as a result of plans to ready some of the government's "moth-ball" fleet. The Senate has approved $25 million for this purpose, with the House yet to take action.

New York—Prior to the Oct. 1 strike deadline, plate mills were confronted with considerable pressure to get out tonnage already on order. Future buying is still sluggish. Most producers at the end of September had backlogs on hand averaging around three weeks. Some declare that without interrupted production, they can take on some tonnage, especially in the heavier gages, for delivery within two weeks. Demand throughout September was featured principally by requirements for light plate from makers of fuel oil storage tanks and heating equipment.

Seattle—Plate fabricators' business is slow, no important projects being up for bids. U. S. Engineer, Walla Walla, has called bids Oct. 5 for 100 tons or more required for tunnel lining, Lucky Peak project. The smaller shops report reduced operations, prospects being none too favorable at the moment.



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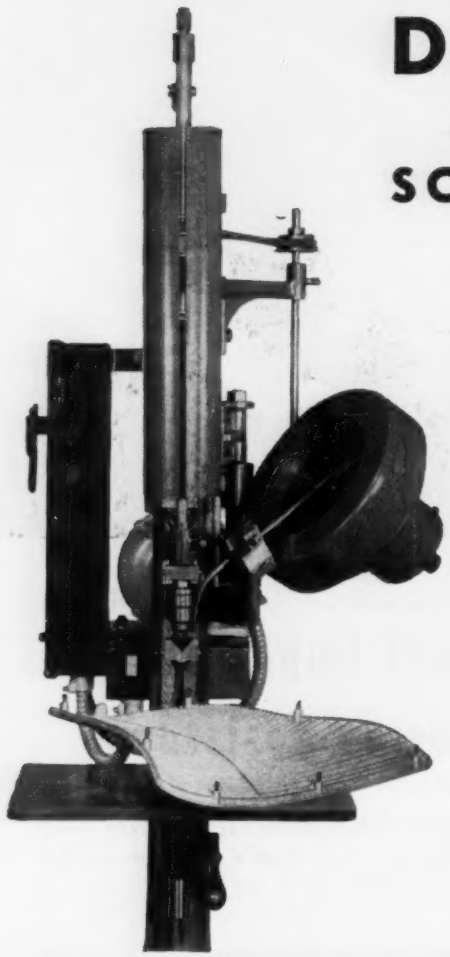

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Wire . . .

Wire Prices, Pages 118 & 119

Pittsburgh—Improvement in manufacturers' wire production schedules initiated in August continued throughout September. This is particularly true for basic wire output. Sellers believe at least a portion of the slight improvement in orders is attributed to desire of customers to augment inventories in view of the continued steel strike threat. Mill order backlogs throughout the entire range of manufacturers' and merchant wire items have recorded little change. Activity in specialties remains slow, while relatively slight easing in demand is noted for merchant items.

Chicago—In most pressing demand at the present time is spring wire, big volume of which is currently being channeled to furniture makers, whose sales are surpassing earlier expectations. Sales of other types of wire and wire products are holding up reasonably well and, in fact, are mounting gradually. Consumers who held up shipments earlier in the year are specifying more freely and are buying in line with actual needs. Competition among producers is notably keen, with feeling being that orders are available but require considerable cultivation.

Tin Plate . . .

Tin Plate Prices, Page 118

Pittsburgh—Tin plate specifications for November delivery are fairly well sustained despite normal seasonal decline indicated for the closing months of this year. Inventories of tin plate held by canmakers are probably sufficient to outlast a relatively long strike, if one should occur. Sellers are more optimistic in regard to fourth quarter production schedules, although in at least one instance output will be curtailed as result of a cold-reduction mill modernization program. A moderate flurry in releases on export tonnage shipments to Canada recently developed in efforts to take advantage of the lower price for the Canadian consumer prior to currency devaluation.

Structural Shipments Rise

New York—Estimated total shipments of fabricated structural steel increased to 172,165 tons in August from 143,561 tons in July, reports American Institute of Steel Construction Inc., this city. Shipments for the first 8 months of 1949 totaled 1,322,803 tons compared with 1,302,745 tons for the like period a year ago.

Bookings during August totaled 97,503 tons, a decline from the 125,601 tons reported for July and bringing the total for the first 8 months to 924,094 tons compared with 1,312,261 tons for the like 1948 period.

The backlog (tonnage available for future fabrication) for the next four months only, stands at 582,798 tons compared with 690,724 tons at the same time a year ago and an average of 350,517 tons for the 1936-1940 period.

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Structural Shapes . . .

Structural Shape Prices, Page 117

Philadelphia—While several sizable projects are active, new structural inquiry is leveling off and awards momentarily are light. New work is still principally of public and semipublic character. Fabricating shops report further modest shrinkage in order backlogs and mills appear to be under no particular pressure. Deliveries toward the latter part of last week were offered at around a month for standard sections and five to six weeks on wide flange sections, provided there were no labor disruptions. The Phoenixville, Pa., plant recently acquired by the Barium interests, and down since early last spring, is undergoing repair and is expected to be ready for full operation around late November.

Boston—Structural fabricating shop inventories are sufficient for nearly three months with fill-ins now available from warehouse; plain standard shapes have eased to the point weekly rolling lists are now available. New work up for estimates is largely public construction, private building being limited to smaller tonnages on which district shops live. Vermont has bids on 1100 tons, two bridges to be placed through contractors. Elliot street bridge, Boston, closes Oct. 6 and Sullivan Square viaduct, due out in November, requires 1500 tons.

Seattle—The fabricating industry is seeking new business as order backlogs are low and operations may have to be curtailed shortly. Several sizable tonnages are pending for state bridges in the Pacific Northwest, the largest 1275 tons for a Bureau of Roads span near Coeur d'Alene, Idaho. Eastern mills are forwarding their commitments in advance of schedule because of the uncertain labor outlook.

Tubular Goods . . .

Tubular Goods Prices, Page 120

Pittsburgh—Pipe and tubing manufacturers have experienced heavy pressure for prompt deliveries because of repeated steel strike threats. New demand for tubing, however, remains restricted, with mills in position to offer relatively prompt deliveries on both mechanical and pressure tubing. Jobbers' stocks of standard pipe items are in closer balance than at any time during the postwar period. Requirements for oil country goods are well sustained, with producers making little headway against order backlogs.

Seattle—Inquiry for cast iron pipe is lacking and while agencies are selling small out-of-stock lots, no important projects are up for bids. The largest, 400 tons, is for 5600 feet of 20 inch pipe for the West Bremerton treatment plant, but lower figures have been submitted on alternative types and the award is still pending.

Warehouse . . .

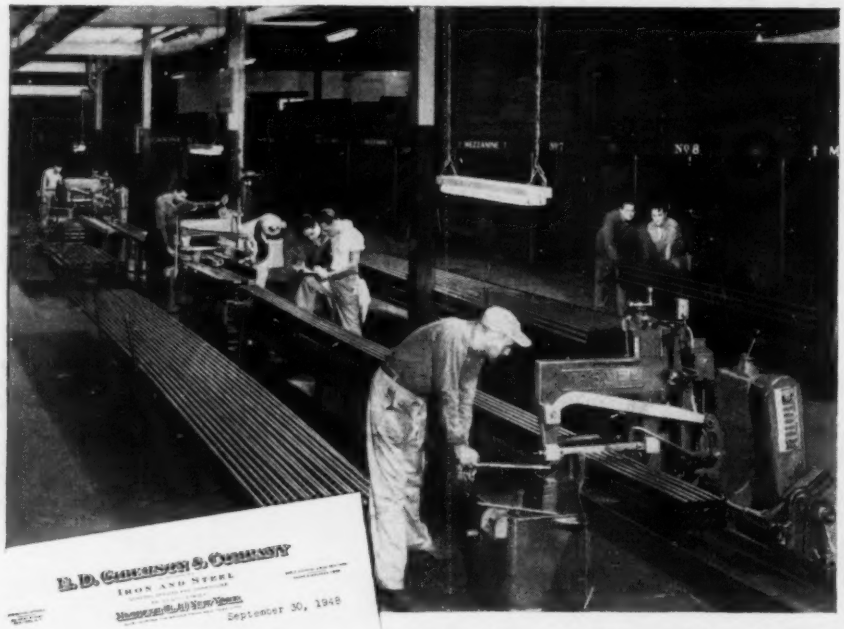
Warehouse Prices, Page 121

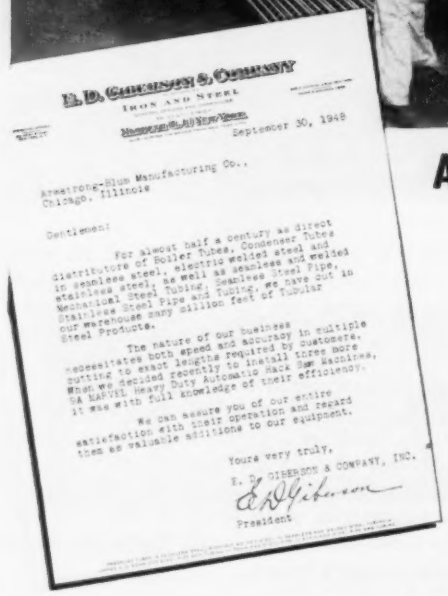
Philadelphia—District jobbers have extended their city delivery area and have increased their trucking extras 10 cents per hundred pounds, as indicated in a recent issue as being under contemplation. As a result, there is now a 25 cent differential between city and country prices as against 15 cents previously.

Warehouse business for September showed a fair improvement over August, due to seasonal influences and some protective covering by consumers because of the possibility of a steel strike.

Los Angeles—Although jobber deliveries still are 10 to 15 per cent greater than they were 90 days ago, activity has flattened out somewhat, and there has been a sharp reduction in warehouse prices. Hot-rolled sheet is down $1 per 100 lb; cold-rolled sheet, down 90 cents; hot-rolled strip, off 70 cents; hot-rolled rounds, 50 cents; cold-finished rounds, 80 cents; standard structurals, 50 cents; carbon paltes, 50 cents; and floor plates, down 30 cents.

Pittsburgh—Shipments from warehouse steel stocks during September extended the gain recorded the preceding month. Much of the improvement in new orders is attributed to protective buying by customers as the steel labor outlook continued threatening. In a growing number of instances, however, steel distributors report buyers have stepped up metalworking operations. They believe October shipments will not be so adversely affected as indicated by

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Iron and Steel
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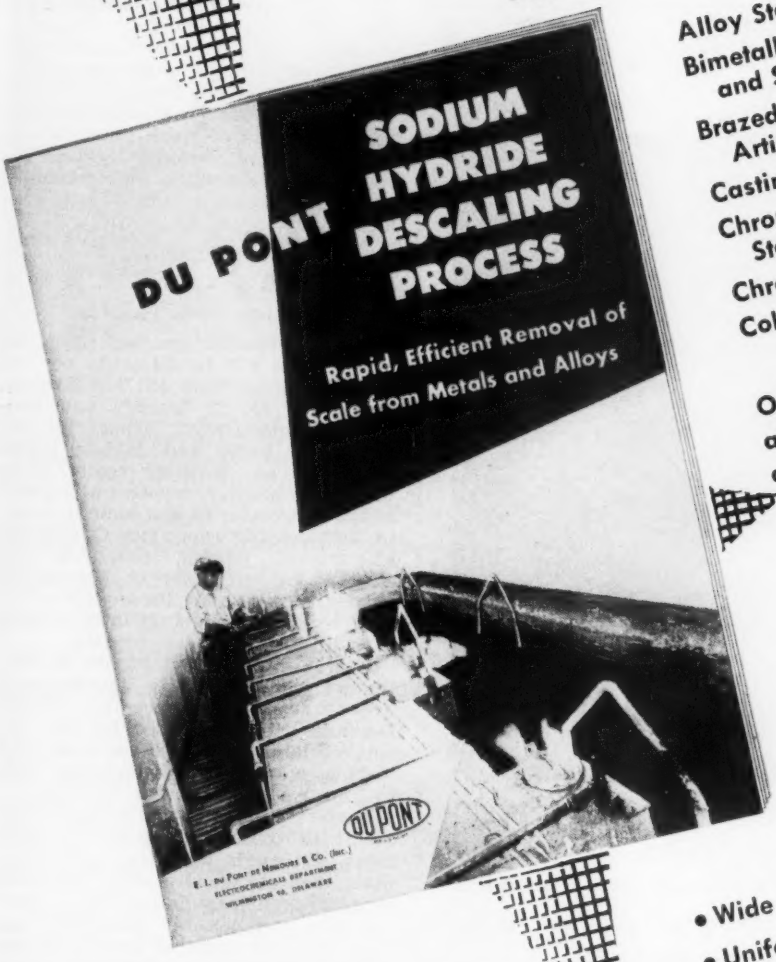
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the abnormal inventory accumulation of some consumers.

Chicago—While it is impossible for warehousemen to differentiate accurately between the volume of new business brought in by the strike threat and that resulting from increased industrial activity, feeling is widespread that the latter is the more important factor. Warehouse business has improved each month since June and personal observation in consumers' plants by warehousemen leads them to believe that much of the buying is for immediate consumption, not as a hedge. Upturn is general, applying to nearly all products, although alloys and cold-finished products continue in good supply and stocks of tubular goods have increased at some warehouses recently. Stainless stocks possibly were reduced too far by some sellers to adequately meet a constant demand which failed to retrench as much as did demand for other products in which the demand inflation of the postwar period was more pronounced. Warehouses probably would change their selling policies somewhat if a strike should occur, although several indicate that no good purpose would be served by instituting a rationing plan on all items.

Cleveland—Demand for plates, hot-rolled carbon bars, structurals and sheets exceeds that for most other products. Stainless sheets continue to move fairly well too. Call is light for other alloy steels and cold-finished carbon bars.

Cincinnati—Sales of jobber steel are heavy. Part of the upturn in demand is undoubtedly because of a spurt in immediate needs. Other buyers wish to add to stocks for protection in case of a strike. Warehouses raised quotations, in most cases one cent, to cover the latest freight rate increase. Light channels and beams are 3 cents higher.

Seattle—Jobbing houses report a fairly steady volume of business, some of it attributed to the labor dispute in the steel industry. Generally speaking, buyers have reduced their inventories and the situation is more normal than it has been for months. Buying is mostly on a hand-to-mouth basis. All out-of-stock items are in ample supply, except galvanized sheets. Price schedules are unchanged except for some minor adjustments in alloys.

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Pig Iron . . .

Pig Iron Prices, Page 116

Boston—Fourth quarter price for Mystic iron will be 50 cents per ton higher, $50.50 and $51.00, Everett, Mass., for No. 2 foundry and malleable respectively; furnace is not producing basic and higher prices are based on operating costs. Shipments are heavier, releases attributed to lower inventories and some increase in demand for castings. Operations at several jobbing foundries are slightly higher. District furnace is gradually increasing its stockpile, but less tonnage is going into reserve than during summer months.

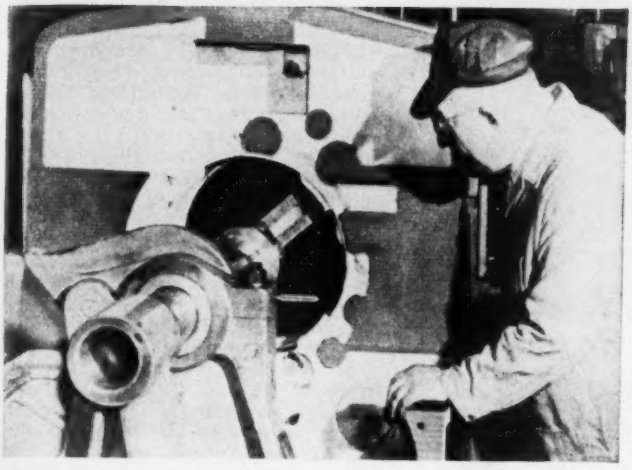
New York—Pig iron buying in September showed definite improvement over that of the preceding month. Demand was stimulated by the unsettled labor situation in coal and steel as well as by a better melt, due to improved demand for castings.

Monetary devaluation abroad may result in some pick-up in importations, although affecting specialties more than standard grades. Swedish charcoal iron may find a better market here and possibly vanadium and titanium iron imports from Norway will be stimulated somewhat. Any particular improvement in the movement of standard grades may originate with Holland, a leading exporter of pig iron to this country. It is thought doubtful if much English or French iron will be imported.

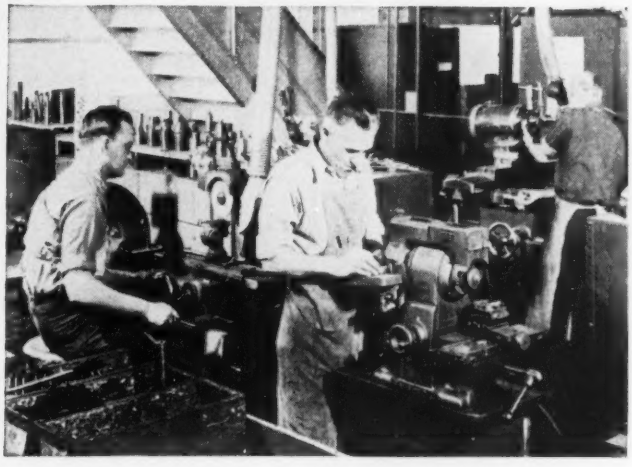
Activity on the other side with respect to the possibility of shipping more pig iron into this country, is confined chiefly to inquiries as to what prices must be quoted to meet domestic competition. Generally speaking, there is a substantial surplus of iron here and little real stringency is anticipated short of labor disruptions.

Pittsburgh—Jobbing foundries report little improvement in operating schedules in contrast to the more optimistic production outlook of foundries serving the radiation and enamelware industries. Operations among foundries making components used in railroad freight car construction are well below 50 per cent of capacity. Improvement among foundries making electrical appliance components

Carboloy "Triple C" Plan pays dividends at New Britain-Gridley



Coordination of carbide tool design and application at New Britain-Gridley, brought about through the "Triple C" Plan, keeps machine down-time at a new low. On this draw-boring application, for example, all carbide-tipped tools are pre-set in cat heads to exact dimensions. For various sized bores, operator merely changes heads on arbor, and has no tool setting to do.



The centralized grinding phase of Carboloy's "Triple C" Plan at New Britain-Gridley resulted in an almost-overnight one-third drop in tool breakage. Carbide-tipped cutting tools are employed on a majority of cutting, facing and boring operations, and have helped lower manufacturing costs, increase production and reduce tool replacement costs.

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COORDINATION of all phases of carbide tool use within the plant, under the direction of a carbide supervisor, is helping New Britain-Gridley lower its break-even point, a factor of concern to all manufacturers.

Under this unique coordinated carbide control plan, the design, maintenance and application of carbide tools are standardized wherever possible. This standardization, applying to about 95% of all single-point machining operations at New Britain-Gridley, speeds up application of tools on the job, keeps engineering costs at a minimum and simplifies the purchase of cutting tools on an economical, scheduled basis.

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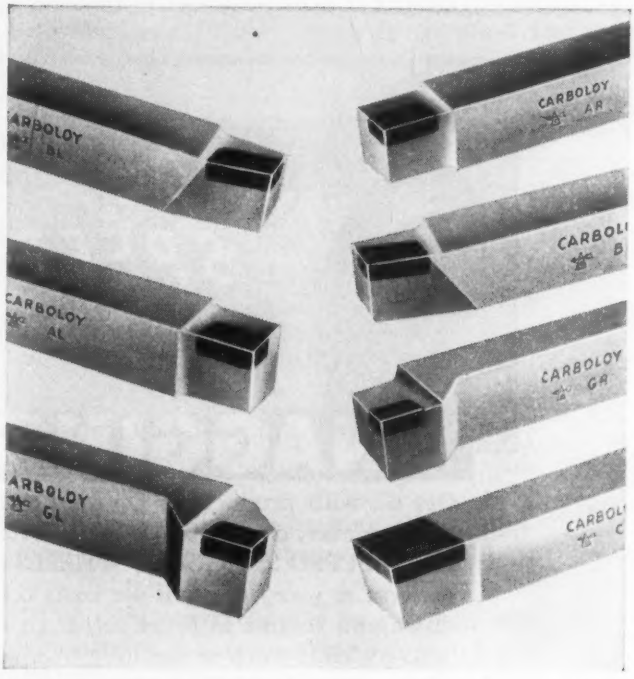

"Triple C" tool standardization allowed over 95% of New Britain-Gridley's turning, boring and facing work to be done by only twenty-nine standard carbide-tipped tools, some of which are shown here.

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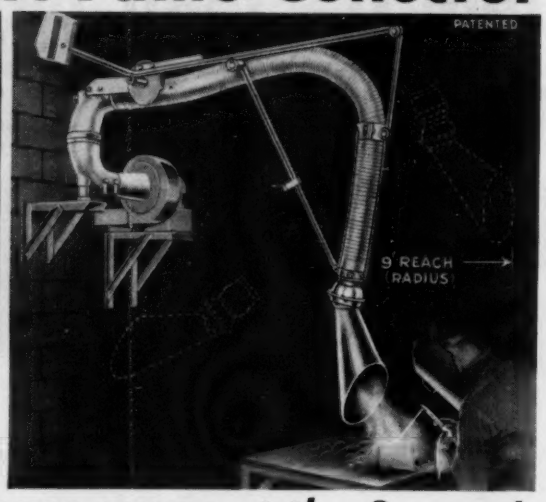

(Above) Welding without ventilating snout. Note smoke clouds and poor vision. Gases and heat surround operator's helmet.

(Right) Collecting fumes with a Ruemelin Fume Collector.

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in other areas has not yet spread to this district.

Leading merchant iron producers here continues to augment inventories despite threat of steel strike. Some improvement in merchant iron is noted, however, due primarily to change in melting operations by foundries with the aim of using more iron than previously because of the recent sharp increase in cast scrap prices.

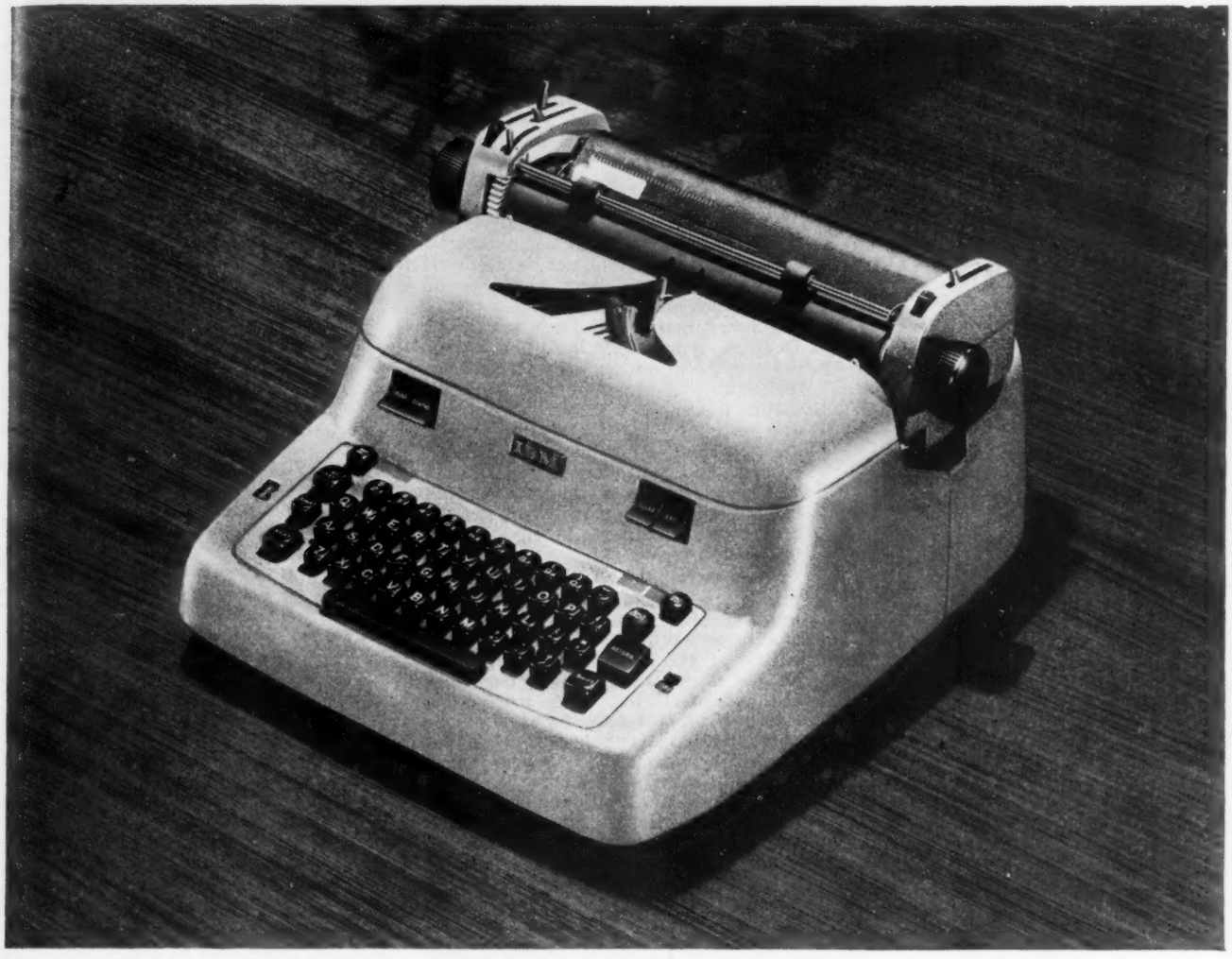
Philadelphia—Most foundry pig iron buyers stepped up their orders noticeably during September, due to better demand for castings and a desire to build up inventories as a precautionary measure in the event of major labor disturbances in steel and prolongation of the coal strike. Particularly because of the situation in coal, foundries also built up their coke inventories as there would be no point to having excess quantities of pig iron without having necessary stocks of coke. It appears that all foundries have at least 30 days' supply of iron and coke on hand, and a number of instances as much as 60.

Chicago — Better-than-anticipated demand for iron has been responsible for postponement of plans for relining at least one and possibly more district blast furnaces. One, which was scheduled to go down Oct. 1, will now be operated until Nov. 1 and possibly beyond depending upon conditions at that time. Another operator has switched a stack from basic to malleable to replenish its pile of merchant iron. Currently, 35 of 42 furnaces in the district are in operation. Iron sellers again are struggling to keep up with foundries' requests for immediate shipment, many of these requests coming from melters who have more than adequate stocks for normal operations but are seeking further protection. Some sellers say many foundries are stocked with four or more months' supply of iron at present and they look forward to repetition of last spring's inventory reduction movement.

The situation is somewhat similar as regards foundry coke. Demand is at a high level as consumers try to build up reserve stocks to tide them over. As yet, there are no reported curtailments in coke making, although sooner or later it is expected that coking time will be extended to conserve coal stocks. This practice is not yet being resorted to locally.

St. Louis—The pig iron picture here is brightening considerably, and the outlook is September will be the best month for sales since April. Another buying spurt has developed with the result orders are now 20 per cent above the August level. New demand is attributed to several factors. Foundry iron stocks are still dangerously low and operators are getting tired of running on a hand-to-mouth basis.

Koppers Co. continues to hold one of its two furnaces at Granite City, Ill., out of blast, but has stepped up the wind in the other for a 2000 monthly tonnage increase. Output of this stack is now estimated at 14,000 to 15,000 tons for September and 15,000 to 16,000 for October. August production was 13,500.



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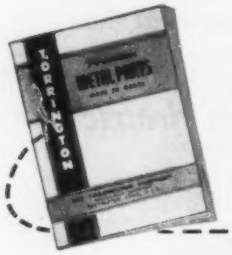

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6

Scrap . . .

Scrap Prices, Page 124

Pittsburgh—Activity in scrap market is at low ebb pending clarification of labor situation. Mills have ample inventories, extending over 30 days supply in some instances. Most steel producers have issued instructions to various dealer and customer scrap suppliers to withhold shipments until threatened strike issue is settled. Trade authorities anticipate still higher scrap price levels when leading consumers re-enter the market for representative large tonnages. Dealers reportedly have relatively little scrap in yards, with result that in fulfilling of large tonnage commitments the scrap will have to originate from remote points with consequent bidding up of quotations. However, should a prolonged steel strike develop, a weakening in scrap quotations would be logical. Cast grades are stronger with No. 1 cupola selling at $36, up $1.

New York—Scrap brokers' buying prices are unchanged throughout the list. Consumer demand for steel scrap has been negligible pending clarification of the labor outlook. Buying of cast is relatively more active than that of steel, but with prices unchanged at $31-$32, f.o.b. shipping point, for No. 1 cupola, $33 for No. 1 machinery, and $26-$27 for charging box and heavy breakable.

Philadelphia—While undertone of the scrap market is still strong, there is not quite the strength noted a short time ago. Major open-hearth grades are unchanged and prices on turnings are easier. Machine shop turnings are now holding at $17, delivered; short shovel turnings, $18; mixed borings and turnings, $16. Low phos scrap is somewhat easier, with bar crop and plate at $27, delivered; cut structurals, $26. No. 1 chemical borings, on the other hand, are higher at $26.

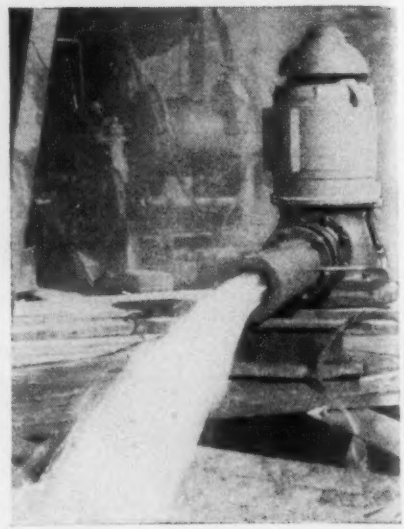
Chicago—Plan by one major mill to purchase No. 1 heavy melting scrap on direct shipment from generators' plants for $28 set the market pace last week and several other grades moved upward sympathetically. No. 2 heavy melting was quotable at $25-$26; No. 1 bundles, $28; No. 2 bundles, $22.50-$23.

Machine shop turnings and mixed borings and turnings advanced to $18-$19, while short shovel turnings rose to $19-$20.

At mid-week, hopes were running high in the trade that some settlement in the labor dispute would come, but a growing amount of caution in entering into new deals for speculation purposes was also evident. Scrap embargo placed in effect by one mill at the beginning of the week had a dampening effect on this optimism.

Cleveland—The scrap market was quiet last week as consumers and sellers waited to see whether there would be a steel strike. Prices as a result remained unchanged. Dealers were accumulating material, indicating they believe eventually buying by consumers will be at a high enough figure to warrant stockpiling.

Cincinnati—Scrap prices are unchanged at the established higher levels, but undertone of the market remains strong. Some interests are



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acquiring additional tonnages, whereas others show a tendency to remain on the sidelines temporarily.

St. Louis—Scrap prices edged upward again last week under pressure of short covering by dealers. As they rise, country shipments decline in anticipation of still higher prices, which adds to the stimulus. Quotations are now $27 to $28, although little mill buying is going on. Foundry demand is picking up for inventory replenishment but no big restocking movement is discernible.

Los Angeles—A wait and see attitude pervades the scrap market as the steel strike deadline approached. Mills continue to show interest in larger tonnages, but future specifying is contingent upon existing circumstances. Prices are steady for steelmaking scrap, although No. 1 cupola cast is up $1.50 to $30.

Seattle — Scrap prices are unchanged. Mills are buying again in limited tonnages, but are not encouraging large shipments because of the uncertain labor situation.

Rails, Cars . . .

Track Material Prices, Page 119

New York—Locomotive demand, virtually all involving diesel engines, continues to feature the railroad equipment market. Freight car buying remains at a virtual standstill, with no early improvement in prospect. New locomotive orders include thirty-five 1000-hp yard switch engines and fifteen 1500-hp road switch engines for the Southern and twenty-seven 1000-hp diesel switch engines for the Indiana Harbor Belt.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 120

Cincinnati — Rationing of oven foundry coke has come on the heels of stoppages in coal mines, such action by the ovens being adopted to spread available supplies. Stocking of coke now, with shipments keyed to immediate needs, is impossible. Possible stringency in coke is one reason for the lack of panic buying of pig iron on which current demand continues on a level considerably higher than that of last summer.

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370 tons, high school building, Milford, Conn., to Berlin Construction Co., Berlin, Conn.; Frouge Construction Co., New Haven, general contractor.

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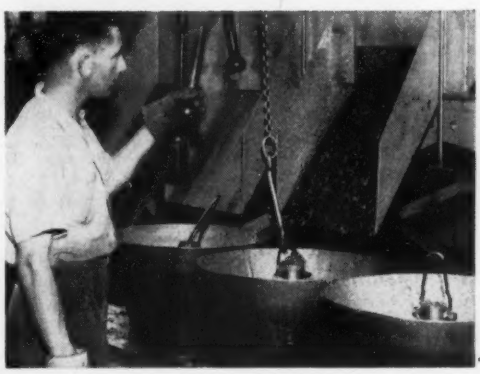

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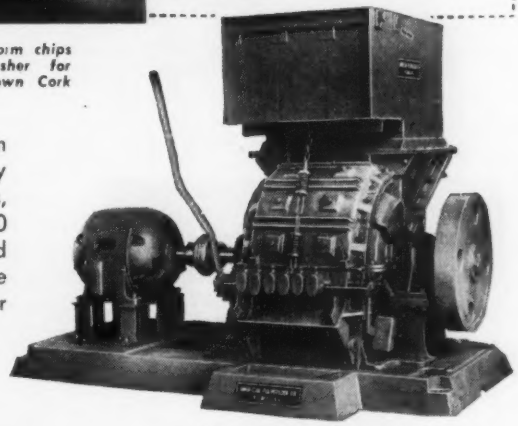

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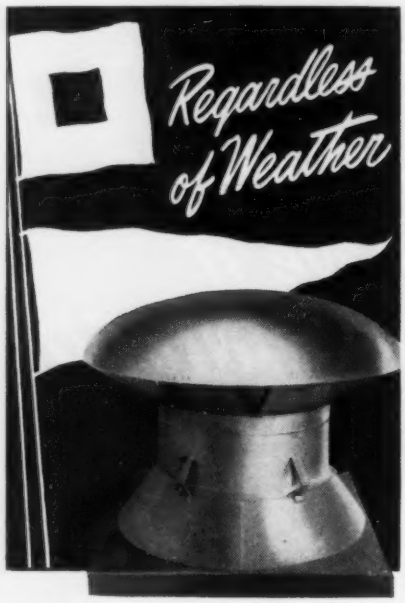

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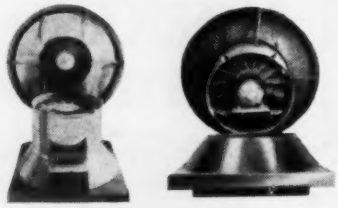

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Sender's Name_____

STRUCTURAL STEEL PENDING

2800 tons, veterans hospital, Syracuse, N. Y.; bids Oct. 25.

1500 tons, hospital addition, Chicago, University of Illinois; bids Oct. 12.

325 tons, steel truss Washington state span, King county; general contract to State Construction Co., Seattle, low $238,640.

300 tons, power house, state hospital, Athens, O.; bids Oct. 11.

215 tons, 24 bulkhead frames, intake structure, Fort Randall dam, S. Dak., 85 tons plates welded to 130 tons structural steel; bids Oct. 18, Corps of Engineers, Omaha, Nebr.

200 tons, theater, Frankford, Philadelphia; bids closed.

200 tons, steel girder Washington state span, Whitman county; general contract to Central Construction Co., Spokane, low $64,195.

200 tons, Oregon state truss 200-foot span, Jackson county; Lindstrom Bros., Portland, low $130,958.

100 tons, including 1450 linear feet steel H-beam piles, White's bridge, outlet Sabago Lake, Standish-Windham, Me.; bids Oct. 5, State Highway Commission, Augusta.

Unstated, Montana state 370-foot steel and concrete span, Gallatin county; general contract to Schye & Sullivan, White Sulphur Springs, low, $173,747.

Unstated, Montana state 256-foot steel and concrete span, Glacier county; general contract to Union Construction Co. Inc., Missoula, low, $121,581.

Unstated tonnage, Public School No. 249, Brooklyn, N. Y.; bids Oct. 11.

Unstated tonnage, Public School No. 175, Queens, New York; bids Oct. 18.

Unstated tonnage, reconstruction of suspension spans of Brooklyn Bridge, New York; bids Oct. 24.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1450 tons, veterans administration hospital, Iowa City, to LaClede Steel Co., St. Louis.

400 tons, addition to Medical-Dental building, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Teufel Construction Co., Seattle, general contractor.

221 tons, main drain, Congress street improvements, Chicago, to United States Steel Supply Co.

200 tons, American Institute of Banking, Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

100 tons, St. Anne's Parish, Lansing, Ill., to Olney J. Dean Steel Co., Chicago.

REINFORCING BARS PENDING

940 tons, Wacker Drive extension, Chicago; bids asked.

232 tons, bridge, Contract 8, Rankin, Pa.; bids asked.

210 tons, Bedford memorial hospital, Bedford, Pa.; bids asked.

200 tons, Washington state road projects in King and Whitman counties; general contracts awarded.

175 tons, Washington state road projects in Okanogan, Cowlits and Lincoln counties; bids to Olympia Oct. 7.

170 tons, Martinique apartment, Milwaukee; bids asked.

150 tons, Skokie river pumping station, Cook county, Ill.; bids asked.

132 tons, store, J. M. Smyth Co., Chicago; bids asked.

100 tons, A. E. Staley Mfg. Co., Decatur, Ill.; bids asked.

100 tons or more, Campus parkway underpass, Seattle; Henrik Valle Co., Seattle, low $154,584.

Unstated, approaches to Bureau of Roads Blue Creek bridge, Idaho; general contract to General Construction Co., Seattle, low $369,580.

Unstated, municipal airport administration building, Missoula, Mont.; Hightower & Lubrecht, Missoula, low, $134,580.

Unstated, Oregon state high projects in Clatsop and Multnomah counties; Frank Watt Construction Co., Portland, low, $77,600, and C. J. Eldon, Portland, low, $185,689 respectively.

Unstated, Oregon State highway office building, Salem; Ralph & Horowitz, low, $1,834,264.

Unstated, Montana state bridges, Gallatin and Glacier counties; general contracts awarded.

PLATES . . .

PLATES PENDING

100 tons plus, tunnel lining, Lucky Peak project; bids to U. S. Engineer, Walla Walla, Wash., Oct. 5.

Unstated tonnage, 100,000-gallon elevated tank, 75-foot tower; bids Oct. 4, Corps of Engineers, Walla Walla, Wash.

PIPE . . .

CAST IRON PIPE PENDING

400 tons, 5600 feet, 20 inch, for West Bremerton, Wash., treatment plant; bids in, also several alternatives.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Indiana Harbor Belt, twenty-seven 1000-horsepower diesel electric switch engines to the Electro-Motive Division, General Motors Corp., La Grange, Ill.

CONSTRUCTION AND ENTERPRISE

MARYLAND

BALTIMORE — American Can Co. has purchased from Baltimore & Ohio Railroad a 43-acre tract on the southwest limits of Baltimore on which it plans to build a plant to produce paper milk containers.

MISSISSIPPI

CLEVELAND, MISS.—Mayor and board of aldermen received low bid from M. T. Reed Construction Co., Jackson, Miss., at $215,700 for industrial plant to be occupied by Baxter Laboratories Inc., Milton Grove, Ill.; Friedman, Alschuler & Sincere, 223 W. Jackson Blvd., Chicago, architect-engineer.

OHIO

AKRON—W. J. Balaun, 1492 Jefferson Ave., has formed Balaun Mfg. Co. to manufacture and deal in tools, parts, machines, etc. Incorporators are Mr. Balaun, R. A. Schorr and L. A. Seikel, attorney.

ASHTABULA, O.—National Distillers Chemical Corp. will construct a water intake crib and approximately 395 linear feet of pipeline in a concrete cradle in Lake Erie if approval is given by the U. S. Army, Corps of Engineers. Designs and preliminary work have been completed for construction of a pumping station, estimated to cost about $300,000, one and one-half miles east of the mouth of the Ashtabula river. Purpose of the pumping station is to furnish raw lake water to members of the proposed Ashco Raw Water Co. At the present time there are only two members of the organization, the National Distillers Chemical Corp., and Hooker-Detrex Corp.

CANTON, O.—United Engineering & Foundry Co. will construct a laboratory adjoining the plant's office building at 1400 Grace Ave. N. E. Estimated cost is $125,000. K. C. Gardner Sr. is president of the company.

FAIRPORT, O.—Dasher Rubber & Chemical Co., a newly incorporated firm, has opened its offices and will begin full scale operations in the warehouse and other buildings of the Pennsylvania & Lake Erie Dock Co. six to eight months from now, delay due to installation of machinery. Business of the company is chemical processing and manufacture of cellulose by-products and processing of quality rubber compounds.

HINCKLEY, O.—Roto-Signal Inc. has been formed to manufacture metallic molded de-